The Builder.

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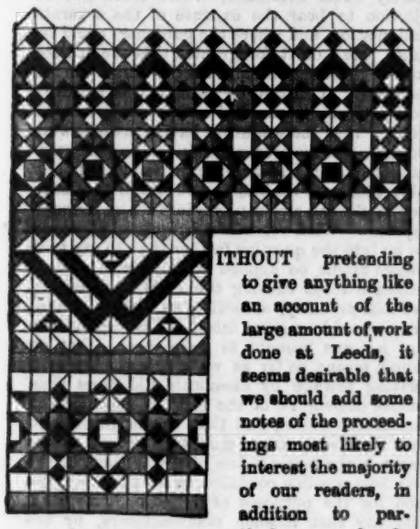
Social Science: the Leeds Congress.



WITHOUT pretending to give anything like an account of the large amount of work done at Leeds, it seems desirable that we should add some notes of the proceedings most likely to interest the majority of our readers, in addition to particulars already given. The meeting was unquestionably a success. The Town-hall in its various courts and apartments afforded accommodation under one roof to all the departments, and the usual hospitality of the district was abundantly shown. The Mayor (Alderman Barran), Dr. Chas. Chadwick, Mr. Ikins, Mr. Fenwick, Mr. William Thomas Jackson (of Headingley), Mr. Filliter, C.E., and others, opened their houses to members of the Association, and entertained many at dinner and luncheon. The presidential addresses by Mr. Hastings, Mr. Vernon Harcourt, M.P., Mr. Baines, M.P., Lord Teignmouth, and others, were full of valuable matter, and the discussions which the arranged questions elicited were practical and useful. We must print a few paragraphs from the presidential address of Mr. Newmarch, F.R.S., in which he spoke of

Capital and Labour.

The Trades Union Act, the speaker said, concludes the long controversy between the Legislature and the working-classes regarding combinations. Peaceful combinations to procure higher wages, shorter hours, and better conditions generally, are now fully within the law, so long as violence, threats, and molestation are not resorted to. The Legislature, so far as it can, has remitted arrangements between masters and men to the only arbitrament which can really settle them—namely, free discussion between the parties. Such arrangements are essentially bargains regulated from time to time by the circumstances of the demand for goods, the supply of labour, and the resources and enterprise of capital; and, without quarrelling or temper, it is the interest and the duty of both sides to discover, by the quiet discussion which takes place in all other commercial dealings, what are the precise and practical terms on which they can buy or sell. A strike is the end of discussion and the beginning of war, and injures both sides. The common-sense course is to set up some middle tribunal composed of representative masters and men, who will meet as people of business, and fix the rate of wages from time to time. It is chiefly abroad that we now hear denunciations of capital as the great enemy of the working-classes. Popular observation among ourselves has advanced far enough to see that, as a general proposition, nothing can be plainer than that the greater the accumulation of capital,—that is to say, houses, shops, ships, railways, manufactures, commodities, animals, tools, and implements,—the better must it be for the classes who live on wages, and who desire to buy with those wages as many commodities as possible. A cheap country means a country where there is much capital, and much, therefore, to sell; and a prosperous country means a country where the industry of the people produces the largest quantity of useful and desirable things, to be divided among the capitalists and labourers who produce them. The first concern of all societies must be to augment the gross produce of the year, so that after providing for the subsistence and comfort of the members there may be a surplus applicable to the cheapening and enlarging of future production.

The Workmen's Meeting.

The workmen's meeting was held in the Victoria Hall, and was as usual one of the most interesting events of the week. About 4,000 persons were present. The appearance of the hall, densely packed in every part, the central gangway and a few feet at the extreme end of the hall occupied by standing listeners, who thus formed a T-shaped figure in the midst of the sitters, was a sight not soon to be forgotten. The platform was also crowded. The Mayor presided, and showed admirable tact in the conduct of the evening. For obvious reasons we adopt the report made by the *Times*:—

"After an introductory address by the Mayor, and a speech by Sir John Pakington on technical education, Mr. Godwin pursued his customary course of giving a description of the sanitary condition of the locality. He said that he could tell them a great deal of what he had seen in other towns, but perhaps they would rather hear something as to what he had seen in Leeds that morning. He would take Back-house-yard and go into Ebenezer-street, Pollard's-court, and other places in that neighbourhood. He found these courts a mixture of humanity and middens. They were filled with children, all sores and sickness. The women said,—and respectable women they were,—'We can do nothing; we have given up attempting to be clean; we abandon ourselves to circumstances, and you see us as we are.' They were wretched, listless. He asked the question, which he had asked five hundred times and oftener, 'How many children have you?' 'Three.' 'How many are dead?' 'Five.' That was the reply of the first woman he met. In the second case, 'How many alive?' 'Two.' 'How many dead?' 'Seven.' As to Back-house-yard, the entrance to it was so narrow that it was quite impossible they could get the coffins out. How it was done he did not know. It was 2 ft. 6 in. wide,—the passage leading to those five houses around the court, with no air, with no single house having a back window, and with a pavement filled with rotting and decomposing matter. There was every circumstance about these courts to induce bad health, and with bad health came listlessness and demoralisation. The whole of these courts were in the same evil condition, and for the honour of Leeds the sooner the whole of them were swept away the better. One of the women said to him most expressively, 'Do go down that court, sir; you will find there smell enough to *rise* a plague.' And so it was. The place was honeycombed with cesspools and middens and drains without traps, and from these there emanated the foulest gases that human nature could be subjected to. Some persons might fancy he was exaggerating, but he spoke of what he had seen from observation sharpened by a long experience, and from an earnest desire to improve the conditions under which the working classes live. Something might be done and must be done by the authorities; but they could all do much to help themselves. With intelligence, an immense deal might be done to alleviate those objectionable conditions; but the ignorance in all classes,—he did not speak of one class in particular,—the want of knowledge as to the necessity for pure air, fresh water, good food, was lamentably excessive. The moment they got into that fine free-library of which they had heard, let them set themselves to work and acquire the elements of sanitary knowledge. Let their children from the very first obtain this knowledge, and the happiness and comfort of the whole community would be increased with it. Until the importance of sanitary improvement was felt, there would be no earnest endeavour to improve their circumstances, and there would be no willingness to spend money. Money must be spent in this direction, and it could not be better spent. There should be no questions whatever about money—at any rate, it should be a secondary question,—because the money spent in these sanitary improvements would bring, he was sure, a fourfold return. It was very sad to walk through the large towns of this country and find nothing beautiful,—no pictures, no places laid out with trees and fountains, and things to accustom the eye, and through the eye the mind, to the contemplation of the beautiful, and the rejection of the ugly,—all which very nearly meant the good and the true. It was to be hoped that in all the large towns endeavours would be made on the part of corporations and public men to gather together objects of art which might elevate and adorn. He understood a park was in contemplation in Leeds. Some people said it was a little too far off, but never mind that; if they could not get it near, get it far off. They would build out to it in time, and then they would be glad that, through their mayor and through those far-seeing men who bought the park, they had preserved some lungs in the new parts of Leeds. He should be deeply grateful if what he had said should lead any of them to look into the truths of sanitary science.

Mr. Newmarsh, F.R.S., Mr. E. Hollond, and Mr. Mundella, M.P., next addressed the meeting; the last-named gentleman giving an account of his visit to Newcastle as a mediator between the masters and the men on strike. A vote of thanks to the mayor, who presided, brought the proceedings to a close."

It was very satisfactory to hear the mayor say at this meeting, that a motion would speedily be brought before the Council to sweep away the district in connexion with Ebenezer-street in a way which would destroy the fever beds there. With the support of the inhabitants, which he was sure would be given, no effort would be spared so long as he was in the Council to rid the town of everything that was a disgrace. The ringing cheers which greeted the announcement seemed to show that this support would not be denied. We are glad to be able to add, that a resolution to the effect indicated has since been brought before the town council, and, after a very brief discussion, adopted.

We must print a few sentences from Mr. Mundella's address. He said he was not the apologist of strikes. Strikes were in the industrial world what wars were in the political; they were only things of the sternest necessity. They starved the labourer, and diminished the value of capital. There was a good deal of alarm at present in the public mind; the people thought that strikes were becoming more chronic, and that there was little work doing. He, however, took a more hopeful view of the relations of capital and labour in this country. He believed we were coming nearer and nearer the end of our difficulty, and arriving at the best means of settling the question. There never was more work being done than at present; and there was never a better understanding between employer and employed. If masters were wise they would treat their men with the same respect and equality as they did those from whom they bought their cotton, coal, and iron; and if they did so he believed they would see a great deal less of strikes than they did at present. So long as the capitalist supposed that in dealing with labour he was dealing with something of a servile nature—so long as he supposed that the article that he bought was not the full return for the money that he gave—so long should they find those misunderstandings arising which developed themselves into strikes.

A few words as to

The Condition of Leeds

may be added, from a speech by Mr. R. Rawlinson, C.B., at one of the section meetings. He said he had had the opportunity of holding an inquiry in Leeds, and of turning his attention to some of the sanitary defects that existed, and he had pointed out previously what in his opinion would have been a remedy for one of these defects. Again he wished to point that out, and enforce it with all the emphasis he could apply, because it would not cost much. Leeds had already been sewered. He might say there were sewers through the main streets, and some of the tributary streets also, but the system was not complete. The sewers were not ventilated

at this moment. The houses were connected with these unventilated sewers. He could assure them that this was one of the elements causing the excessive mortality of Leeds, and he pleaded with the people of Leeds to make the openings up to the streets as they were made in London, to let the gases come up at as many points as possible, and thus the atmosphere would dilute the gases and render them innocuous. Then some of the streets were paved; others in the suburbs were not paved at all; and Leeds should not permit its population to be dragged down by the miserable condition of any street. Even streets in the heart of the town were in a bad state. For instance, the street in which he was staying was disgraceful. It was a paved street, full of ruts fit to break any springs that might go over them. It was no economy to leave a street in that condition, and he urged that the work of repairing such streets should be commenced at once. If the town had not the money it should be borrowed; if it had not the power to borrow, then, in the name of goodness, let the town go and get power.

We have received a dozen letters inquiring what was decided at the meeting as to

The best Means of Removing and Utilising the Sewage of large Towns.

Mr. C. Rawson, general manager of the Native Guano Company, read a paper in the Health Section, "On the Utilisation and Deodorisation of Sewage by the A B C Process," and made several hazardous assertions, such as, that at least one acre of land was required to utilise the sewage of 100 adults annually. Mr. Rawson said, in conclusion,—

The last argument I have to advance in favour of the "A B C" process is certainly not the least conclusive one. It is successful in a commercial point of view, and pays. Even in the south of England, where coals and chemicals are far more expensive than in the north, our native guano costs us only 30s. to 35s. per ton, leaving a clear profit of 2*l.* per ton. Now, I will only instance the case of one city, to show what a profit of 2*l.* per ton really means. The metropolis daily pours into the Thames 100 millions of gallons, or 448,740 tons of sewage. From experiments we have made with this sewage, we estimate that the "A B C" process would convert this into over 1,000 tons of dry manure, worth annually, at 3*l.* 10*s.* per ton, the enormous sum, for the metropolis alone, of 1,282,500*l.* I cannot conclude this paper without mentioning to the section that the authorities of Leeds resolved some months ago to make an experimental trial of our "A B C" process. Their works are hardly yet completed, and certainly not yet in such neat condition as we hope shortly to see them; still, they will afford any gentleman interested in the solution of the great sewage question an opportunity of seeing our process in actual operation. We shall welcome any such visitor, and give fuller explanations than are possible here. I trust that these trial works will be found such a success by the town council that all their daily eleven million gallons of sewage may shortly be treated by "A B C" to their profit and ours. The works are situated at Knostrop, to the south-east of the town, and adjacent to the river Aire. On the left of the entrance is a chimney, 90 ft. high, which takes the products of combustion of two boilers having a nominal power of thirty horses each, and also the steam and gases from four drying-sheds. Each of these sheds has an area of about 1,000 square feet; they are heated by steam, which passes below iron floors, the mud being placed on these in a thick liquid state. Over the surface of these floors a current of hot air is drawn from the boiler-flues, escaping at the further end of each shed by flues leading to the chimney. It will hence be seen that the principle of drying involves the double mode of applying heat both above and below the mud. For the purpose of increasing this upper drying, a cover is placed at a small height above the mud, removable when it is dry, and replaced when fresh mud has been spread on the floor. The effect of the cover is to increase the draught, and, at the same time, it prevents waste of heat. The remainder of the arrangements in regard to machinery, "A B C" pits, and the agitating or centre pits, &c., are precisely similar to the general plans I have already described. The settling-tank, which is at the south-east of the works, has a length of 170 ft., is 24 ft. in width, and about 12 ft. in depth; but till we have had some experience in working the Leeds sewage it is impossible to say the exact number of gallons of sewage we shall be able to treat in the twenty-four hours.

Mr. W. T. McGowen, town clerk of Bradford, read a paper entitled "The Sewage of Manufacturing Towns: What shall we do with it?" Having very largely reviewed the question of town sewage, the writer came to the conclusion that although sewage irrigation may be resorted to advantageously in the case of small towns where circumstances admit of the proceeding being successfully and inoffensively carried out, these are sound reasons for holding the system to be impracticable for large manufacturing towns if they are to undertake the whole operation themselves; and that if the sewage of those places is to be applied to the purposes of irrigation, it can only be done in some such way as has been suggested—by the Government making main outfaces to sea sands with a view to their reclamation; and that, meantime, the local authorities would have to direct their attention to the best means of purifying the sewage in the vicinity of the stream to which the water belongs, by mechanical or chemical means, or both.

Various other papers were read. In the discussion which followed,—

Mr. W. H. Michael (London) complained that gentlemen read papers which showed that they were totally unacquainted with the first questions essential to the success of irrigation. The gentleman who read the first paper had said that a sewage irrigation farm was a bog. He could never have been at a good sewage irrigation farm. The same gentleman had said it would be detrimental to health. There, again, he had never been at a sewage irrigation farm properly conducted. The Edinburgh meadows were not a sewage farm; they were managed in total contrariety to the very first principles of the proper sewage irrigation farm. The solid constituents of manure which one gentleman proposed to remove and economise were the worthless part of it, and the first thing in dealing with irrigation was to separate the whole of the solid constituents. The admirable method adopted by Mr. Baldwin Latham in his new machine made this successful. Any process which might be proposed that tended only to separate the solid constituents of sewage must be put aside as utterly worthless. Gentlemen who wanted in the interests of the public health to remove the difficulties in the way of dealing with sewage were not wedded to any one system; but the difficulty was that when the subject was discussed gentlemen got up and advocated their own measures, looking at it as a commercial speculation, as some means of making profitable manure at so much per head of population. That, however, had nothing to do with their question. The value of the whole of the manure, he maintained, lay in the fluid portion, and it was this fluid portion, the soapsuds, and slops, and the urine that formed the difficulty to be got rid of, and any system which did not deal with this fluid failed to achieve the primary essential to be adopted in treating sewage. So far as he could see at the present time, irrigation was the only process that answered the necessary conditions, of taking that which it was requisite, should be taken from the excreta, and it could be applied to land without creating the slightest amount of nuisance even to persons living in the immediate vicinity. There was no cause of disease which had been shown to have arisen from sewage irrigation, and the latest experience proved that on sewage irrigation farms so large a per-centage as 10 per cent. could be returned for the money invested by local authorities in the creation of that which relieved them entirely from the nuisance, and which must prove a benefit, in every sense, to the rate-payers.

Mr. Rawlinson said, with regard to the power of manipulation, they were told that dry earth disinfected immediately. Well, if it did, he would say that water stopped putrefaction for a limited time,—for a safe time to enable it to flow beyond the precincts of the town; and if that were so, with a properly-arranged water-closet there was no trouble,—there was simply the pulling of a handle to get the water supply, and the offensive matter passed away. Now, if there was an earth-closet, there must be separate intervention at least once a week, but, if perfectly clean, at least once a day. If there were two or three earth-closets in a house, how could the servants be expected to manipulate them in a cleanly manner on all occasions. There would be 365 manipulations a year, if they were daily, and if weekly, 52. The value of the manure was called 12*s.* per head of the population, and he asked if any one would accept that remuneration in respect of the manipulations in his house. The dry-earth system might do for detached dwellings, for large establishments, for gaols, for barracks, for any place where persons were entirely under command, where there was no objection to bear the expense of the separate manipulation, and where the gardeners could be found. He took it for granted that the excreta must be removed, either in the dry state or in the wet state. If in the dry state, it was removed necessarily by mechanical means, or by human agency. If in the wet state, having made sewers and drains under proper conditions, and properly ventilated them, the excreta removed itself to any point that was desirable; and where necessary they might call steam-power into use under such a system. With regard to irrigation, he would not go into the question further than to say that sewage might be applied to land with perfect success without causing the smallest nuisance, and that probably, according to circumstances, there would be a great income. The conclusions that he was brought to were these,—that no human means, so far as we at present know, of treating sewage by chemicals did more than remove one-eighth of the salts of sewage from the effluent water; and that the brightest and best clarified sewage, nearly as bright as the water in the bottle before him, was then in the very best possible condition to be put upon the land for the purposes of irrigation. He could only say that if such manufacturers, by the "A B C" process, could make the manure worth 3*l.* or 4*l.*, or any higher amount per ton, they would do what all the chemists he had been in contact with told him that it was impossible to do. However, these gentlemen said they got that price for it, and there he must leave the question.

Mr. E. Chadwick, C.B., maintained that the cheapest mode of removal was by water, which arrested decomposition, and carried the sewage away most completely. As to earth-closets in the tropics, he had no experience of India, but as to the West Indies he knew he had been consulted upon the means of providing deodorants to get rid of very troublesome insects. Decomposition began ordinarily in three or four days, and if they attended properly to sewage they would get rid of it in a day. Excreta ought to be in the field, not in mechanical suspension, but in chemical combination. He regretted that in this town of Leeds, for thirty or forty years, the place should have remained in the state it was with a death-rate augmented. There was a very large, pecuniary loss to the town occasioned by lost labour, and the effects of premature debility, owing to ignorance of sanitary science on the part of the town.

Mr. Councillor Marsden said he was very much disappointed with what the Association could do for towns that were anxiously considering their difficulties, if all the benefit to be received was represented by the papers read that morning, there being nothing precise and certain in what was recommended. He advised that a system should be taken into consideration by which the different elements of sewage should be kept and dealt with separately.

Mr. W. Hope, Q.C., gave some most interesting details as to the system of irrigation pursued on his farm of 121 acres at Romford, maintaining that his experience demonstrated irrigation to be a most successful method of utilising sewage. In order to use sewage fully, he should like an acre for every twenty persons, but to purify it a very much smaller area was sufficient. The portion not used became inorganic, and therefore innocuous. The commercial success of his undertaking enabled him to pay 600*l.* a year to the town of Romford. He ridiculed the theories as to the generation of entozoa in animals fed on irrigation lands, and said that the horse-pond was the great source of such diseases. The manure obtained by the "A B C" process he pronounced almost valueless.

We adopt the summing up of the President of the Health Department, who, in closing the discussion, said he had been sorry to hear from a member of the Leeds Corporation that he had learned nothing; and he hoped

that when that gentleman reflected upon the subject, he would see that his means for arriving at a conclusion were very much increased by the discussion of that day. At any rate, he would say this, that if the gentlemen then around him knew nothing on the sewage question, there was no person in England that did know anything. He wished, in the interest of the community at large, to urge that irrigation should be employed extensively, and in all places where it could possibly be adopted; and he asserted, moreover, that he had the strongest ground for doing so. What was the use of a Royal Commission, of a Committee of the British Association, and of the Rivers Pollution Commissioners, in all cases coming to a conclusion in favour of irrigation, if persons, who could not possibly go into the subject minutely to the same extent, were not to attend to the recommendations made, and believe that irrigation was, under the greater number of circumstances the best mode to adopt. And he maintained that the evidence from the established farms, from Mr. Blackburn's farm at Aldershott, of which he knew something, and a number of others, as at Croydon, and Mr. Hope's valuable farm at Romford, ought to induce them to say that irrigation was the best means to employ. With regard to the "A B C" process he was anxious, knowing that it was a great interest, not to do anything unfair; but really he was compelled to remark that these gentlemen inferred more than they could possibly prove. They said they got 3*l.* 10*s.* per ton for the manure. But could they prove that it was worth 3*l.* 10*s.* per ton? Such chemists as he had spoken to said it was not worth the cost of the process which it went through. It was all very well to say that they had sold so many thousand tons, but they had not yet proved the value of it, or that the farmers would continue its use. Then, with regard to the effluent water, which they said they were quite willing the irrigators should have. That did not answer the question at all. Was it true that this effluent water was sufficiently purified? He, however, feared to pursue the subject, seeing that the process was now a great commercial speculation, but nothing that the "A B C" advocates had said or done had affected his mind on the subject of irrigation. It had been shown that they must get rid of sewage immediately, that water was the readiest means of transporting it, and that when properly disposed of on land, it really did no damage whatever to surrounding persons; there was China, for example, a country where they had had irrigation at work for 1,000 years, and a great deal longer period by their own records—and all the evidence was, he thought, in favour of irrigation. He hoped the people of Leeds would look into it. They must no longer delay, with a thousand middens: their fearful death-rate told them of the work that had to be done. As to the "A B C" process, they must satisfy themselves either as to its goodness or its badness. If good, let them adopt it entirely; but if bad, then, at once they must set to work to get land and irrigate it with the sewage.

At another meeting of the Health Department, Dr. Fergus, Glasgow, read a paper on the production of disease by air and water pollution. He stated that the reappearance of diphtheria as a disease in this country was probably owing to our own carelessness in the disposal of excreta. Typhoid fever also (killing annually from 15,000 to 18,000) was produced by our trifling with our systems by either contaminated air or water, the results of excremental pollution. He exhibited soil-pipes from water-closet towns, which were corroded by sewer gas, and which had caused typhoid fever. The principal grounds for believing that this state of the pipes arises from sewer gas, he said, were that the perforations were generally in the upper surface of the pipes, and from within; also, that in pipes that are ventilated the corrosive action is much slower than it is in pipes where the gas is not allowed to escape at the top. This state of pipes was not easily detected, as plumbers looked for liquid leakage; and as the perforations were on the upper surface, there could not be any liquid leakage. One specimen he pointed out, where a plumber had renewed the water-closet, but failed to detect the state of the pipes. Typhoid fever being in the house, he (Dr. Fergus) had insisted, from the smell, that the pipes from the closet must be corroded. He showed that cholera and diarrhœa are caused by the same carelessness in the disposal of excreta; that the decomposition of excreta takes place even in the best constructed sewers; and that the result was highly detrimental to health. In large towns the sewers were a perfect laboratory for the manufacture of sewage gas, and this gas was continually getting into our houses from water-closets and sinks.

Mr. Baldwin Latham, the engineer of the works at Croydon, explained the operations carried on in that town to utilise the sewage. The plan was to remove as far as possible the sewage in its perfectly fresh state, the sewers having the requisite inclination to carry the matter with sufficient rapidity to the outfall, and before six hours were over the water was passed over the land and passed off again perfectly pure. From a sanitary and an economical point of view the experiments at Croydon had established the success of irrigation.

In reply to questions, Mr. Latham said the best plan of dealing with sewage gas was to introduce ventilators, accompanied by charcoal trays. The gases were various, including sulphuretted hydrogen, and they were allowed to escape at the level of the street.

Strikes.

In the Economy and Trade Department, Mr. Frederick Hill read a paper on the question "Whether Strikes are necessary for the Protection of Workmen, or Locks-out for that of Employers." He said it was generally admitted that strikes and locks-out were great evils, but many persons regarded them as unavoidable. The author, however, held a different opinion, believing them to be no more essential to the system established by our benevolent Creator than are wars and pestilences. He pointed out that when wages, as compared with profits, were too low, or the hours of labour too long, then, without any joint action of workmen, some employers, stimulated by a high rate of profit, would speedily try to increase the number of their workmen by offering higher wages, or a reduction in the hours of labour, or both; while competition would soon compel other employers to do the same; and that the converse would be the case when wages were too high or the hours of labour too short. He pointed out, also, that every shilling of wages or profit which, by a cessation of work or the stoppage of machinery, was lost, was so much withdrawn from the fund on which workmen and employers alike depend; and, so far as it goes, must be a subtraction from the general rate of wages and profits. He said that if his reasoning were correct, its practical application would be the abandonment of all attempts artificially to regulate wages and hours of labour, and a willingness to leave the matter to the quiet but certain operation of natural law, affirming that it is good policy, on either side, to pursue this course, even if it should not be adopted by the other. He gave it as his opinion that the wisest action on the part of any employers who might be subjected to a strike was at once to yield to the demand, if such a proceeding would impose a smaller loss than would be caused by a temporary stoppage of their business; while workmen should, under similar circumstances, and with the same reservation, yield to their employers in case of a threatened lock-out; since both parties may fully rely for rectification on the power of a law to which both employers and workmen must succumb. He maintained that the interests of workmen and employers, instead of being opposed, were in unison, and this even in the matter of wages; pointing out that if a number of workmen and employers met together to agree upon a scale of wages, they would find that one and the same scale would be best for both parties,—viz., that which was most in accordance with the actual state of the labour-market. For, if the scale were placed too high, a motive would be offered to men to come in from other works, while the employers would have an inducement to transfer part of their capital to other concerns; and if the scale were placed too low the men would straightway have a motive for seeking employment elsewhere. He referred to the beneficial results of bringing employers and workmen into friendly conferences, and to the great good accomplished in this way by Mr. Mundella. If these premises were admitted, both parties in the strike at Newcastle acted unwisely, the men in making the strike, and the employers in resisting it,—except, indeed by argument, as was done, and with success, by Mr. Stephenson. He proceeded to show that it is an error to suppose that a decrease in the quantity of work performed would be followed by an increase in the rate of wages, whether paid by time or by the piece. He expressed also his belief that, for the most part, intelligent workmen have now discarded the idea that wages depend on the will of the employer, though he pointed to experience as showing that this want of power in the employer is no obstacle to the voluntary performance of those acts of kindness and good offices which the possession of superior means always suggests to a kind heart. The paper then referred with condemnation to the school which maintains that, instead of capital being labour's mainspring, it is its unaided produce, or, as affirmed by some zealots, labour's enemy; and on this point spoke of the document, so replete with ignorance and folly, which has lately been addressed by the International Society to the people of Switzerland, but to which the author trusted the Swiss were too intelligent to give ear.

After the reading of Mr. Frederick Hill's paper,—

Mr. George Potter said, in regard to locks-out and strikes being great evils, he went with the author of the paper at once, and admitted them to be so. But he believed from his own experience for the last ten or twelve years they had been necessary, and not only by the action of working men, but generally by the coolness and disinclination shown by employers to workmen, when they asked for what they thought a fair day's wages. It was always said that the men made the demand, and the masters could not afford to give. They had only the masters' word for that. The unions had asked the masters, when they said they could not afford a rise of wages, to submit their books to an impartial arbitrator, and if that arbitrator said the masters were losing, the demands of the men would be immediately withdrawn. This request had never been granted; they had been told that the plan was impracticable. The workmen had always made the demand for higher wages, and had met with refusal; hence strikes. The result of strikes and combinations of workmen was to give the workmen their position, which they would never have obtained otherwise. He looked upon the effects of strikes as not transient, but abiding; and, in conclusion, he appealed to them not to force the cause of every strike and lock-out upon the men. The men were quite willing to bear their share of blame for the blunders: they were not perfect; but was it all their blame? Had not capital aggrandised to itself more than its fair and just reward? Was it right that working men should toil from one year's end to another for the lowest rate of wages? It was a question upon which they now met upon different ground. The success of the Newcastle men, the increasing success of working men generally, had brought employers and workmen to look upon each other differently from what they formerly did. Instead of strikes they should have conciliation. He laid much stress upon conciliation; if the employers but met half a dozen of their men when any demand was made, and talked it over in their offices, he took it that in nine cases out of ten it would be harmoniously settled. If there was a difference between men and their employers, let them have arbitration. The men had always, whenever an arbitration had been decided against them, gone and worked under the decision.

Mr. C. Lamport entirely agreed with those who thought that strikes had been necessary, and he said this as an employer of labour. Mr. Hill, speaking from a purely philosophical point of view, said these things would arrange themselves; but when? There were two difficulties in the way of a master showing his books to the men. In the first place, he might be a person who had not the capital to carry on his business, he might be in debt, he might be ruined, and if the books were examined his ruin might come out. He did not say that would not be a good thing, but they were dealing with human nature. He was free to admit that labour had not had its full share of the amount of profits due to it. But why? The workmen paid a portion of these profits to obtain for themselves the advantage of insurance. The remedy for these things was certainly boards of conciliation. But boards of conciliation acted against the master in many cases in the most important and objectionable way, for this reason. The men went into court, and the masters went into court. The decision was given in favour of the master, and against the men. The men, as a body, most honourably kept their engagement; but what tied the men as individuals to their master? The master was fixed, but the men were not fixed.

Mr. James Wilson thought it was manifestly unjust that the hours of one class of men should

be by combination reduced to a minimum, while the great body of the people of the country, who had an equal interest in producing the wealth of the country, were compelled to work for a much longer time. He took exception to the description of the action of strikes given by Mr. G. Potter. As far as he had known it he had known it as of the most cruel, most unrelenting, and most merciless character. The interests of the employers and the interests of the workmen were one and the same. What they wanted to bring about was mutual understanding and fellow-feeling.

Mr. G. J. Holyoake thought strikes, by the mode in which they had been conducted, were a very blundering process indeed, and he never had any sympathy with that mode of improving the rate of wages. He had always been more inclined to the forming of co-operative manufacture, which placed the workman in a position of power over their own resources, and enabled them the better to effect that improvement which they desired. But he quite believed that if combinations of workmen had done nothing more than put into the power of working men the means of treating upon something like equality with their employers, those combinations would be amply justified. He wished to see the working men in such a good position that they should neither supplicate for the goodwill of others nor be dependent upon it.

Mr. Wallace, Halifax, said that in the district he came from there had been an advance of from 50 to 60 per cent. in wages without the aid of strikes. He knew no tyranny equal to that of trade-unions. By their operation the country was going back to the old system of guilds.

Mr. E. W. Hollond thought that with regard to the general aspect of capital and labour and their interests, there was one sense in which the interests of labour and capital were identical, and another, and a very important sense, in which they were always opposed. Their interests were identical in that they were both engaged in producing a certain article; it was sent out to the world, and both gained from the products of the sale. The aspect in which the two were opposed to each other was in the division of the gains from the profits of the sale.

Visits were paid to the sewage works at Knostrop, to the Reformatory at Mirfield, to Temple Newsam, to Kirkstall Abbey, and to the very interesting Norman church at Adel. We can only add that the next Congress will be held in Plymouth in 1872.

LONDON ALOFT.

The roofs of London are rising with portentous celerity. The two square bases which mark the period of extreme depression in the English architectural taste, when the light of heaven was taxed, and people seemed to fear that the air they breathed would be taxed next, are happily disappearing from our streets. In a few years they may be expected to become as rare as their gabled, timber-framed houses, with floor projecting on floor, of which a fine example still marks the site of Staple's Inn. With some features that seem to us inconvenient, or even unsightly, these ancient homes of the citizens combined many elements of comfort. In these up-piled stories they contained accommodation for the lodging of household and visitors, of children and grand-children. The low, squat, two-storied huts, such as line part of Tottenham-court-road, appear, on the other hand, to combine the maximum of structural ugliness with the minimum of economy of area, and to be the most unfit and inconvenient form of dwelling ever yet introduced into a city,—if, at least, that title be denied to a mere collection of wigwams.

Paris used, in the days of the *bourgeois* king, to strike us by the height of the houses, as compared to those of London. A climb *au huitième* was not uncommon. Indeed, when photography was first invented, the lofty perches sought for the convenience of the skylight familiarised us with many a ladder-like stair. Still the successive stories were, for the most part, of low height. The *entresol* would hardly allow a tall man to stand upright. The principal floor, indeed, often contained a suite of rooms of noble proportions; but above this you generally found little more than nests of cupboards. This was before the days of Haussmann, and the systematic regularity of the Rue de Rivoli. But, comparing the habit of renting *appartements* with that of renting houses, there is no doubt that the population per acre of Paris was far denser than that of London, speaking of such portions of the two cities as most resembled one another in the character of their inhabitants. The mean density of the population of London is stated by the Registrar-General at 40 to the acre.

A great change, however, is coming over London in this respect. The sanitary importance of giving due height to the rooms in which they pass no inconsiderable portion of their lives, is becoming more thoroughly realised by City men. At the same time the value of land is augmenting, the value of time is increasing, and the importance of having a *pied à terre* within a certain very limited area is yearly more obvious. Architecture is responding to the commercial requirements of the day—and loftier rooms, and more numerous stories, are raising the newer city houses into veritable towers.

There are extant old engravings representing some of the Italian towns, Lucca, we think, or Pisa, in the fifteenth or sixteenth centuries, which differ very materially from any existing groups of dwelling-houses. Genoa is, perhaps, one of the loftiest of modern Italian cities. The chief characteristic of that stately port is the number of blocks of lofty palaces divided from each other by lanes as narrow as the "rows" of Yarmouth, which have involved the construction of cars of a specially narrow gauge for their service. But the older cities had not the luxury of the modern port. The houses were high — even higher than the present Genoese palazzi, but they were small. They were, in fact, chiefly towers. A collection of edifices resembling those round towers in Ireland that have caused such very long antiquarian discussion as to their origin, was a mediæval Italian town.

In fact, building, like dress, armour, carriages, ships, or any other requisite of civilisation, of which we can trace the histories, has been a faithful reflex of the habits and the requirements of the age. When violence was so rife that each man found his own arm his most ready protector, and when the most formidable projectile was the cloth-yard shaft, or the bolt of the arbaleste, people naturally built towers. They afforded at once the means of a safe outlook, and a security against escalade. Many a seignoral keep dotted the country in those troublous times. But the existence of towns of towers is a fact that we should not now recognise as having existed, but for rare and curious graphic records. Its cause, however, is perfectly intelligible. With the introduction of gunpowder, a change took place in building as well as in defensive armour. The domestic tower disappeared, and houses gradually shrank down to economic pigeon-holes, that formed the meanest architectural phase of the domestic building of England. Economy was written on every house-front in the plainest text; economy, that is to say, of area and of cubic contents, of bricks, mortar and slates; of light and air, of comfort and of health. How much of the enfeebled health and diminished natural powers of our urban, and indeed of our rustic population, we owe to the pestilent little holes in which it became customary to cram away people for the night, we shall perhaps never fully understand.

A counter movement has, however, set in, and attained a very notable advance. In the country the beehive-like cottage is becoming a thing of the past, and the great landowner is beginning to take a pride in the architectural elegance of the rebuilt villages. In London the movement has assumed more striking proportions. City houses which, when first built, were considered almost too lofty and too aristocratic in their air for the abodes of business,—such as the buildings in Moorgate-street, for example,—are now looked down upon as but little removed from "poking." A lofty office is felt to be a requisite for a man who would be thought to drive a first-class business. In this, no doubt, there may be much foolish ostentation, much reckless following of fashion; but yet good is done, even if not from good motives. Health is greatly promoted by the increased size, especially by the increased height, of rooms. With health comes increased capacity for the good conduct of business. Architecture, pictorially considered, is greatly the gainer; and the honest and praiseworthy industry of the builder, the skill of the architect, the courage and enterprise of the capitalist, all find occupation and reward. Prices are forthcoming, in the way of rent, that more than cover the increased outlay. In one new building that springs into the air near one of the great wagon-shaped railway roofs that disfigure London, for the ground floor—a single large room, capable of subdivision—a rent of 1,500*l.* per annum is asked. The first floor is rented at 1,000*l.*; the second floor is let at 500*l.* Then there are a third floor and a basement. A large building outlay is justified by the power to earn such rents as these.

On ascending any eminence, either within the precincts of the metropolis, or on one of the ranges of hills which command its area, the eye is arrested by the appearance of lofty structures of very recent date. Of these the most self-arresting are the large piles of the Langham Hotel and the Victoria Hotel, which are conspicuous not as sending up towers or spires to the sky, but as rearing great castellated structures to an unusual height. The new Record Office has recently displayed a very picturesque outline. The lofty clock and Victoria towers of the Westminster Palace, with the spires and pinnacles that adorn the same noble pile, cast the twin towers of the Abbey into shade, and have done more to improve the architectural *ensemble* of London, when viewed from a distance, than it was possible to anticipate. The Charing-cross and Cannon-street roofs,—frightful mistakes, either in an architectural or an economical point of view,—lose much of their shapeless deformity in a distant view. The roof of St. James's Hall, with its huge wind-cowls, attracts curiosity as well as attention. The somewhat squat bulk of the Royal Albert Hall also afflicts the eye.

It is not, however, in the Albert Hall alone,—a building the large area of which renders necessary a considerable elevation for the structure, whatever be the outline given to that elevation,—that the tendency of the present rebuilders of London to mount is apparent. Two large buildings are on the point of completion under the auspices of the authorities at South Kensington. We have before described the new School building which looks down on the Exhibition-road and almost overshadows the Royal Horticultural Gardens. But the mere height of the building deserves note. The accommodation afforded by the structure is large; the view from the balcony or from the roof is superb. When we see, on a valuable site indeed, but one of which the acreage value has not yet reached the ninth part of the price asked in the City, commodious offices thus arranged, floor above floor, in a building which is at once healthy and elegant, we cannot doubt that the example will be rapidly followed. The only drawback to this method of economising building area is the fatigue caused to the occupants of these great *palazzi* by the height to which they are compelled to climb. But here the rapid development of mechanism comes in aid; and we have no doubt that a manageable and economical arrangement of lifts for ascent and descent will form a prominent feature in the City house-building of the future. The tidal rise of the Thames might be made use of to work these lifts conveniently.

The new courts of the South Kensington Museum yield another example of rooms of size hitherto rarely paralleled. Two enormous red gables have recently been completed, to the south of the mass of the new buildings of the Museum. The Patent Office looks crushed beneath their shade, and gives the idea that it is only waiting to be crumpled up, and rolled away to some more appropriate locality. In fact, this, which is one of our most important institutions, can no more thrive under the shadow of its more holiday-making neighbour, than corn can grow under the shade of a beech tree. The country owes much to Mr. Bennet Woodcroft, who has not only opened the monopoly of patent knowledge, that is to say, knowledge of what patents exist, and of the contents of their specifications, freely to the public, but has also, by his own personal influence and exertion, rescued from decay some of the most interesting relics of the mechanical art of England, and brought them together for the instruction of our children. A proper home for this collection, and a proper recognition of Mr. Woodcroft's great services, are among the things for which it is disgraceful to have to plead,—things which have been neglected solely from the unobtrusive modesty of a really deserving man. This, however, is by-the-bye, although it is a bye that naturally ensues from a visit to the large courts of which we speak.

They form a sort of twin hall, or double apartment, divided by an arcade. The length of each court is 120 ft.; the width, 60 ft.; the

height, about 90 ft. The ceiling is curved and panelled, the panels being filled with ground glass. The purpose of these large rooms is to afford a place for the display of objects too large to be placed under shelter elsewhere. In some of the costly reproductions made for the Museum, such a home is a necessity. Thus the wonderful *portico da Gloria*, casts of which have been procured from Spain, has been made to look little short of ridiculous by being cut in two, and the arch stuck on the ground, opposite to the entrance of the Museum. The Sanchi Tope, moreover, has had to lift its head through the floor of the International gallery. These, and similiar structures, will be safely fixed, and commodiously viewed in the New Courts. A gallery runs round each hall, at the height of 60 ft. from the ground, from which a sort of bird's-eye view of the entire court can be commanded. There is no doubt that the halls are well adapted to the purposes of the Museum.

One name, amid that of the ten centuries of builders who have made London what she is, impresses itself on the mind of any observer of the lofty towers and of piled roofs that are yearly thickening in the landscape commanded from the hills of Highgate or of Sydenham. One great master-builder foresaw that a great city, cramped in its area, might expand in its vertical structure. Let us raise our warehouses, our offices, our public buildings, to any readily conceivable height. Let us shoot up our men of business on steam lifts, and double the elevation of the halls and schools of South Kensington,—St. Paul's will still soar above them all, and will the more proudly assert, the more closely modern builders climb after its lofty proportions, the genius of the man who was aptly termed in his epitaph the builder of this fane and of this city.

SOME ARCHITECTURAL (?) ADVERTISEMENTS.

If we were only to credit the assurance of those who advertise themselves as prepared to supply or to manufacture every kind of thing that an architect can possibly require to render his buildings perfect, it should seem that we are totally without excuse if our edifices are not overflowing from top to bottom with ornamental work, all "of the best description," and "in all styles;" not to speak of the innumerable new patents placed before us for preventing or curing all the practical ills that buildings are heir to. As to these last, indeed, any one unacquainted with the actual shortcomings of defective ventilation, smoky chimneys, &c., which we know too well do exist, might suppose that all such causes of complaint must be for ever at an end, after the perusal of even a comparatively small proportion of the documents which set forth the merits of Smith & Co.'s chimney-tops, Brown's ventilators, and Jones & Robinson's smokeless grates;—all patent and all perfect, all guaranteed for the future, and having received medals in the past. These are practical matters, however, in which one mechanical inventor may be allowed to pit himself against another, seeing that the final test after all is the question, which every practical man can on trial answer for himself, whether these said inventions really accomplish what their patentees or vendors profess they shall accomplish. A large number deserve every consideration; though in many cases, perhaps, the first conviction of the purchaser would be something like that celebrated principle of the Irish Republican,—"One man's as good as another, 'faith, and a great deal better," or a great deal worse, as the case may be. But there are some other advertisements which the reflective architect can hardly contemplate with the same equanimity. These are such as deal not with practical inventions of the above-mentioned type, but which proclaim the readiness of their authors to supply all sorts of ornament and ornamental work *ad libitum*, with a cheapness and despatch never before equalled, &c. Architects, it is true, know how to give their due weight to these attractive proposals; but the less skilled public are apt to be tempted by the bait, and to imagine they have got something worth having, more especially when the advertiser claims to have invented some new species or application of ornamental work; for if a man only praises his own work thoroughly, there are always plenty of people ready to believe him; and the (apparently) inherent disposition of the English public of the present day for cheap showiness in all their surroundings, leads them to offer a ready custom for any new device which combines these two desired qualities. We leave the application of these remarks to our readers.

Few things are more remarkable in this way than the supremely ugly forms assumed by patent chimney-tops to prevent down-draught, the illustrations of which are accompanied with an assurance that "they are very neat in appearance"; the word *neat* being that upon which your patentee generally falls back when he has invented something which even he cannot venture to describe as ornamental. Why is it that all our "patent" contrivances are so ugly and awkward-looking? Look at the "ventilating globe light," for instance; a very good contrivance for keeping the effluvium of gas out of a room, and preserving the air fresh, but could anything uglier well be conceived? Unhappily, it should seem, the mind of the mechanical inventor is impervious to considerations of fitness and beauty of form; so long as the thing works well, he is satisfied, and expects the public to be so; and most of them, we fear, are satisfied. Not but that some inventors and advertisers soar above these sordid feelings. There was an advertisement-sheet sent round to the profession during the last month or two, concerning some improvement in hot-water coils, we forget of what nature; but one of the advantages set forth was that no grating is required over these coils, as they are "made ornamental," so that they can be openly placed in a hall or vestibule, &c. We certainly enjoyed that phrase, "made ornamental:" it speaks volumes, though it scarcely could be properly appreciated except on comparison with the accompanying figure or diagram of this ornamental production; the ornament, as usual, consisting in the imitation in the cast-iron of certain established "architectural" features; in one specimen the pipes (upright) took the form of columns with moulded caps and bases, supporting a top plate which, as the advertiser cunningly hinted, could be used as a table. Ingenious advertiser!

Among illustrated advertisements of what is supposed to be ornamental work none are more remarkable in a way than those which exhibit and recommend chimney-pieces. Remarkable they are for the utter absence of hint at anything thoughtful or original in a class of object which we should have thought peculiarly susceptible of variety and novelty of treatment. But one firm after another advertises its "largest and richest assortment of marble chimney-pieces in the kingdom," with accompanying illustrations showing the same old worn-out forms of conventional Gothic or Classic type, as the case may be. These advertisements are, however, perfectly truthful, for if we go to the repository, we shall find that they do really represent all that the manufacturers have to offer. As to the ornamental metal-workers' advertisements, we do mention them with a certain degree of awe. Every now and then a metal-working firm which thinks a new push requisite, comes out with a fresh pictorial device for attracting public attention. The main object in getting up these seems to be (there are exceptions) to get the maximum amount of twisted "Mediæval" leafage into the allotted space, and to render the wording of the address so illegible, through its excessively "decorative" character, as to furnish a puzzle of a minute or two to the reader. It is only justice to say, however, that these are almost the only illustrated advertisements which show something of artistic device. Are they not pictorial too? and do we not all know the figures of the accomplished workmen, moustached, and hammer in hand, at work on an altar-standard, and looking as if they thought themselves the most important of all possible members of society? This last trait, we fear, is a little too near the truth. The typical "art-workman" is not a very modest person: he has, perhaps, been spoilt, patted on the back a little too much; but the idea conveyed by his manners too often is, that he would have you know he considers himself a great deal better than most people on God's earth. Some of this self-conceit he will have to unlearn. Nineteen-twentieths of the work he does is, after all, only a more or less clever repetition of the work of another period; and *handiwork* is not the only thing in this world, though it has been much talked up in these very practical days.

We noticed how comprehensive are architectural advertisements, providing for "every possible want" of the architect; an expression which would be fully borne out by a study of them; for they even offer to provide him with that first great requisite—"brains." This, we know, was the medium with which a certain great artist averred that he mixed his colours; and these are on sale in the advertising mart, along with other requisites of the craft. The number of draughtsmen who are fully competent to make drawings, details, and specifications of all kinds is remarkable. Some only profess church work; others are more general in their qualifications; but it is to be noted that the special statements of knowledge of what is termed "classic" work are rare: it is to be presumed that the market for "this particular variety" is not considered to be brisk at present. Then there are the competition colourists, who give you, with charming *naïveté*, a list of the competitions which have been won under their colours,—a significant indication of the way these things are "managed." There is a gentleman, we see, who undertakes to prepare designs promiscuously for any architect "from rough sketches;" but whether such designs, when done, are to be publicly credited to the advertiser, or to the authors of the "rough sketches," does not appear: the point is not unimportant, though, in its bearings on the working of the profession. These advertisements mostly represent, however, the legitimate endeavours of younger members of an overcrowded profession to find work for themselves in assisting others; as such they must command sympathy, even though we may think that some of the advertisers might be doing more useful work in the world, if they would only think so, than colouring up other people's designs to look finer than they really are. There are less praiseworthy or excusable kinds of advertising, in connexion with the profession, otherwise than through the medium of "columns." What are we to think, for instance, when we hear of architects, well off and in good practice and reputation, sending touts round the provinces (on their own account) to "push" their books of designs, &c.? We have heard of such things. The *modus operandi*, as described to us, is very refined, however. The tout, who lets you know that he is a friend of the distinguished architect whom he represents, of course insinuates that Mr. —— has no desire to make money by the beautiful work which he has the privilege to show you; indeed, Mr. —— is above the necessity of looking for money, "as you will doubtless be aware, sir: he married a very large fortune," &c. He is only anxious that others should have the benefit of the work, at a cost that may be called quite nominal. "Messrs. Peeksniff & Co., sir, say that this work has been invaluable in giving them ideas in ornamental design;" or, "You will observe this finial, sir. Mr. Gargoyle said it was the most beautifully drawn ornament of the kind he had ever met with," &c., &c., *usque ad nauseam*. We hardly think *that* is the way to raise the dignity of the architectural profession.

THE CONDITION OF LONDON SEWERS.

The metropolis of England is said to be the best sewered city in the world; and this may be true. But is London complete in main sewerage and house-drainage arrangements? A faithful reply to this question is of far more importance than a mere boast. Cities, in ancient times, were sewered and were supplied with water on a grand scale. Public buildings were also erected which, for grandeur of design, beauty of detail, and power of endurance, put to shame modern efforts.

But to the London sewers: are they perfect? A diagram in the last Number of the *Builder* (October 14th, 1871, p. 809), shows that they are not perfect. There are, in the aggregate, about 1,500 miles in length of tributary sewers in the metropolis, serving to drain about 350,000 houses, and it is probable that 50,000 of these houses have no proper direct connexion, or, at best, have a very lame and imperfect connexion with the adjoining sewer. The whole of the houses are indeed, to a certain extent, imperfectly drained. Many of the house-drains are square on cross section, flat in gradient, and pass from back to front beneath the basement and area floors. Some drains are brick-barrel—that is, circular on cross-section, flat in gradient, and consequently the sewage is sluggish in its flow, or, for the most part, soaks into the subsoil, or evaporates through any chinks there may be. The old flat-bottomed sewers of deposit, and the large sluggish house-drains also of deposit, are the abodes of rats innumerable. Grit from roads and streets, with gritty refuse sent in from house-sinks and yard-grids, form

banks and shoals, over which the rats walk and scamper at leisure. The house-drains being at higher levels on each side of the main sewers, afford shelter in times of rain-floods. It is said that there are distinctive tribes of rats in the London sewers, gifted with all the noble attributes of human tribes, clans, and factions,—jealous, fond of excitement, revengeful, ending in fighting, bloodshed, and rat-murder; the rat Capulets and Montagues being as proud, as quarrelsome, as vindictive, and as revengeful as the bipeds living and walking above them. A rat Romeo risks his life if he goes courting to a rat Juliet in her noble father's domain. The London sewermen (rat-catchers), who minister to the aristocratic sport of rat-worrying, know the several tribes of London sewer-rats as well as a Highland shepherd knows his sheep. But to the defects in London sewers, which admit of all these interesting underground phenomena. London has been, and now is, parish governed. It has been said that the government of London is an unbound bundle of parish vestries, of which St. Pancras is a burning and shining example. Well, in the early days of sewering there was no recognised cross-sectional form for sewers: there was no systematic mode of setting them out so as to secure truth in line and in gradient; but they were constructed by rule of thumb, in short lengths at a time, without any reference to a defined bench-mark, so that in line they are up and down, just as chance determined,—this irregularity being, however, all in favour of the rats. At first, water-closets were not allowed to be connected direct with the sewers; and in many cases house-sinks were not connected directly. The old sewers were made without any side-junction arrangements; so that to connect a drain the brickwork of the old sewer had (and has now) to be broken through. This cost money, and therefore the economical vestries charged for the connexion some two guineas, besides the cost of the drain connected. This breaking through tended to ruin the sides of the old sewers; but it also tended to a worse thing,—that is, to the prevention of any connexion, bad or good, being made with the sewer at all. Thousands of houses in London, old and new, East-end and West-end, have drains unconnected with the street-sewers. Now, is not this "a pretty kettle of fish," for the metropolis of England? But even at this day it is not the business of any official to see that the drains of houses, old or new, are in direct and proper connexion with the street sewer. The Metropolitan Board must confine its attention to the main intercepting sewers. The district surveyors under the Building Act, have nothing to do with it. And it seems not to be the imperative duty of the surveyors to the parishes to see that house-drains are properly and safely connected. Hence the existing muddle. How much of disease and premature death results from this defective state of things, it is impossible to say; but of a truth there is much sickness, lassitude, and suffering, because of sewer gases pervading houses in London. Think of a delicate patient coming from fresh country air to consult a London physician, who has his consulting-room over a colony of rats, and whose house is pervaded with diluted sewer air! When London ceases to be exempted from municipal government, and the St. Pancras vestry has been improved off the face of the earth; when the local government of London has been consolidated, and when the officials have learned their duties, and execute them; then the hundreds of miles of old and defective sewers will be reconstructed or repaired, and the tens of thousands of defectively-drained houses will be put into safe and proper connexion with the renovated main sewers. The accomplishment of this work will, however, be death to the rats, and the interesting natural history phenomenon now going on beneath our feet will cease.

A PEEP AT AN EAST-END CEMETERY.

By common consent the grave, as our last resting-place, is sacred, and all its surroundings, since the first dawn of history, are marked by the respectful attentions and observances of the living. Who amongst us does not experience a revulsion of feeling, and a tingling of shame coursing through his very nature, when beholding an act disrespectful at the grave, or a course of conduct, unhappily not yet rare, in desecration of the dead?

We have been looking at the burial-place of eastern London, called Victoria Park Cemetery. An inscription over its jejune Gothic-arched gateway tells us the date of its opening, 1845. Who its present owners or directors are we do not care to know, though we believe the ground or cemetery originally belonged to a late deceased M.P. of Hackney. What its profits are we are also unable to learn, though, judging from the number of weekly interments there, they must be something enormous. We are credibly informed by a resident in close proximity to the cemetery, that on one certain day, between the hours of two and five, *one hundred funerals* arrived. Of course this was an exceptional case; but the same person said, that on an average the burials might be taken throughout the year at from 150 to 200 a week, though 300 have been known to be interred there in one week. The cemetery is not a large one, and the system of interment adopted is such that it could well afford a small outlay, and the employment of a staff to keep it in some sort of proper order. It is, however, no libel to state, and from a personal visit we are enabled to say, that its management and present state are really a disgrace to London. For fifty or more yards ahead of you, as you enter, there is a rough, rugged carriage-way or roadway, which winds round after a short distance, and rises as it winds, decreasing in breadth as it proceeds, and merging in the central part of the graveyard into two collateral footpaths, or semblance of footpaths, leading to the distant corners of the graveyard.

In fact, there are no walks or footpaths, properly speaking, after you pass onward a short distance. There is no boundary walk or path around the four walls of the cemetery within: the graves abut right up against the wall in nearly the entire circuit, excepting a space on each side of the entrance not yet opened for graves.

In the centre of the cemetery all is disorder, dirt, long lank grass weeds, and all the unnatural growth that rankness and absolute neglect encourage. But very few graves are dressed, and the majority of the tombstones are crumbling to decay from their friable nature. Nearly all the slabs are of the most rotten description of freestone; and the lettering, which was not sunk in the first instance more or even as much as ¼ in. below the surface of the stone, and then painted black to throw out a deep shadow, is in nine cases out of twelve worn off. Thus are the poor robbed of their money even at the grave by unprincipled mortuary masons, whom they trust with the erection of the slightest tablet. There is no indication of drainage throughout this cemetery, and on a wet day the condition of the only carriage-way in the graveyard is such as to render it nearly impassable from deep sludge. There is no paling, railing, box hedge, or bordering of any kind along the entrance avenue or short sideways, and only the merest and shabbiest attempt at a garden plot of a few feet wide and long immediately within the entrance-gate. This could only be intended as a mask to hide the defects of the hideous and howling wilderness within. All beyond this is ghastly and disgusting. The graveyard within is yearly rising and swelling up far above the level of the surrounding neighbourhood. Tier after tier of corpses is packed in deep and narrow graves ranging from 16 ft. to, perhaps, 20 ft. deep. Children's coffins four abreast,—but we hesitate to give a multiplier for fear our readers might be led to suspect exaggeration. The depth of the coffin once ascertained, the "dead reckoning" may be gauged with a certainty.

Here, grave almost touches upon grave with scarcely a decent partition of clay between, the head of one grave and the foot of another often meeting below the surface, though the coping of clay on the top sends visitor and mourner away with their illusions undispelled. Here the newly-made graves of the poor run side by side, forming ridge and furrow, each little mound bare and undistinguishable from its neighbour, nor date, nor name, nor index directing. Thousands of graves that once had an elevated mound or coping are trampled level with the earth, and are matted over with living and decayed vegetation, with no stone, no epitaph, no history. All is blank over large spaces.

The spread of the metropolis in the east end of London raises once more the serious question of intramural burials. Independently of the disgraceful condition of Victoria Park Cemetery, the question of the public health must force itself upon the mind of all. The spread of house property and the great increase of population in the vicinity of this graveyard suggest the serious consideration whether it will not be soon, if it is not already, advisable to close up this and similar burial-grounds, which, though outside the town a considerable distance at their first opening, are now so situated as to be productive of danger.

Victoria Park Cemetery is nearly full to overflowing at present,—it is badly kept,—its directory or owners appear to have neither taste, sympathy, nor respect for the living or the dead. Their whole desire seems to be to make as much out of this hideous patch of ground as they possibly can. One thing is, however, certain: if the directory of this cemetery wish to protract or keep in abeyance the anger of the public, they had better at once make some improvement.

ST. MARY'S CHURCH, MIRFIELD, YORKSHIRE.

The new church here was consecrated by the Bishop of Ripon on the 12th inst. It is situate on the west side, and close to the site of the old parish church, and is in the Early English style. The plan consists of nave and aisles, chancel, south porch, tower, and two vestries at the north-east angle, one of which is appropriated to the choir. The tower is at the west end of the nave, and adds considerably to the length of the church internally, its dimensions at the base being 30 ft. square, exclusive of buttresses. It rises 140 ft. from ground to top of the pinnacles, the vanes rising 6 ft. beyond this. It contains a clock and ten bells, cast by Messrs. Taylor, of Loughbro', the tenor weighing 30 cwt. 1 qr. 22 lb. The bell-floor is of great strength, and covered with lead, as also is the roof.

The clock is supplied by Messrs. Potts & Sons, of Leeds, and strikes the quarters on two bells. There are three dials incised in the stone work, the hands and figures being gilt. The principal entrance is through the south porch; there is also an entrance from the west end through the tower: this doorway is composed of a recessed and moulded arch, supported by stone bases, with detached stone shafts and moulded capitals, the tympanum being filled in with diaper and carving; also a circle sculptured, representing the Annunciation of St. Mary.

Internally, the nave is 82 ft. long, and divided into five bays; it is 27 ft. wide. The tower is 21 ft. square; the aisles are 13 ft. 6 in. wide; and the chancel, 40 ft. by 27 ft. in clear. The entire length internally is 150 ft. 6 in.; the width in clear, 60 ft. 4 in.; the height from nave floor to ridge, 64 ft. The church is lighted by coupled windows with splayed jambs along the north and south sides, and by three lancet windows in the tower; the west one of which is to be filled in with stained glass by Clayton & Bell, and presented by Mrs. Ingham, of Blake Hall. The east window is a triple lancet, with circular window over, and two coupled side windows to sanctuary. The clearstory is arcaded both inside and out, with a lancet window pierced through the middle of each bay. The roofs are open, and of pitch pine; the principals of nave, chancel, and aisle roofs spring from stone corbel shafts with moulded capitals, the spandrels being filled in with tracery. The arches of nave arcade are moulded, and supported by stone moulded bases. The pillars are circular, and octagonal alternately, the capitals of the latter being carved.

The tower is vaulted with stone ribs springing from carved corbel shafts at the angles, the cells being filled in with local stone in thin courses. The seats are of oak throughout, the chancel stalls and screens being rich in detail, with the moulded chancel arcade, and fossil marble columns add to the appearance of the whole. The pulpit is of oak, and stands upon Caen stone base with green marble shafts supporting. In the panels are figures carved in oak, representing St. John, St. Paul, and St. Augustine of Canterbury, the divisional triple shafts being in walnut. The pulpit is presented by the parishioners as a testimonial to the late respected vicar, the Rev. R. Maude.

The font is of green marble, the bowl being square externally; on each side is a quatrefoil sunk panel, with carving inserted, representing the four rivers of Paradise, with green marble caps and base, the small columns and centre shaft being Irish red marble. The reredos is profusely enriched with carvings, diaper panels, marble figures, and the caps, bases, and panels being in Derbyshire spar, the divisional clustered shafts in Cornish spar; the arcading on either side is executed in Caen stone.

The floors and passages are of stone, laid

diamond-shape, about 12 in. square, the floor of sanctuary being encaustic tiles. The stone used for the exterior is from Mr. J. Walker, St. Michael's Mount Quarries, Barkisland, near Halifax; also the dressings of the interior, the walling inside being local stone, rubbed to a smooth surface, the outside being tooled diagonally.

The architect is Mr. G. G. Scott, R.A., under whose direction the work has been carried out by Messrs. W. & J. Milner, of Mirfield, and under the immediate superintendence of Mr. H. Roome, as clerk of works. The carving has been executed by Messrs. Farmer & Brindley, London; the reredos by Mr. Earp, pulpit and font by Mr. Phillips, coronas and altar-rail by Messrs. Potter & Son, all of London; chancel stalls and screens by Messrs. Rattee & Kett, of Cambridge; seating for nave and aisles by Mr. Thompson, of Peterborough; the roofs, doors, &c., by Messrs. Barker & Plough, of Mirfield. The church is warmed by water, the apparatus being supplied by Mr. J. Brooke, of Huddersfield. The total cost will be about 25,000*l.*

At the luncheon after the service, Mr. Scott proposed the health of the contractors for the work, and the clerk under whose superintendence it had been carried out, and spoke in high terms of the workmanlike manner in which Messrs. Milner had executed their part of the contract.

ECCLESIASTICAL DILAPIDATIONS ACT.

Norwich.—Mr. B. M. Phipson, of Norwich and Ipswich; Mr. J. H. Brown, of Norwich; and Mr. E. L. Blackburne, F.S.A., of London, have been elected surveyors for the diocese of Norwich, under the new Ecclesiastical Dilapidations Act. There were seventeen candidates.

Hereford.—Mr. Thomas Nicholson, architect, of Hereford, has been appointed Surveyor of Ecclesiastical Dilapidations for the diocese of Hereford, under the new Act.

Lichfield.—This diocese has been separated into three superintendencies;—viz., for the Archdeaconry of Derby, Messrs. Stevens & Robinson, of Derby; an architect at Stoke has the Archdeaconry of Lichfield; and an architect at Shrewsbury has that of Salop.

Canterbury.—Mr. Lucius Spooner has been elected for the eastern division of this diocese.

Ely.—In consequence of the large area of this diocese, it has been decided to divide it into three districts for the purposes of the Act. The three surveyors who have been appointed are, Mr. W. M. Fawcett and Mr. R. R. Rowe, of Cambridge, and Mr. Day, of Bedford.

NOVEL MODE OF UTILISING SEWAGE AT GLASGOW.

Although Glasgow is far behind London in regard to its sewage arrangements, yet it is about to adopt a plan for utilising part of its sewage, which now runs into and pollutes the Clyde, that London might very well follow, if the several municipal Boards were only to take joint action in the matter. A contract has just been entered into between the sanitary committee of the Police Board of Glasgow and a company in that city for utilising the urinals. The Police Board are to collect and supply to the company 5,000 gallons per day for twelve years, for which the company are to pay the Police Board 1,000*l.* per annum. It will be collected in close tanks, and will be removed during the night to the company's works, where it will be resolved by a chemical process into sulphate of ammonia. The contract is to take effect from the beginning of next year.

ARCHITECTURAL ART CLASSES.

ARCHITECTURAL MUSEUM, WESTMINSTER.

A joint committee to overlook these classes for the ensuing session has been constituted. The classes will open on Thursday, the 2nd of November, at 7·30 p.m., and will meet on the evenings of Tuesday, Thursday, and Saturday in each week from 7 to 9·30 p.m. during the months of November, December, January, February, March, April, May, and June, excepting during one fortnight for the Easter recess.

The Figure-drawing class, instructor Mr. F. Weekes, is divided into two sections:—1. For the study of the antique; 2. For drawing from the living model and the draped figure. The fee is 7*s.* 6*d.* per month, which it is hoped to diminish as the number of students increases.

The Ornament class is to be under the guidance of a committee of visitors, among whom are Messrs. Waterhouse, Burges, Cockerell, Seddon, E. W. Godwin, Tarver, Florence, and T. H. Watson. The whole contents of the museum are available for this class, which will meet, besides the evening named above, on Tuesday, from three to five p.m., and studies may be made at all times in the daytime when the museum is open. The fee is 2*s.* 6*d.* per month.

Prizes are offered for work done in the various classes, and it is intended to provide a course of lectures upon the contents of the museum, of a character similar to those of last year, which were well attended. Intending students should send in their names at once to Mr. Thomas Henry Watson, the hon. secretary.

MORE DIFFERENCES.

Sir,—Pray have the kindness to insert the following lists of tenders:—

For alterations and repairs to stables, coach-house, and laundry, in rear of 28, Bedford-place, Russell-square. Mr. C. H. Edwards, architect:—

Collins	£136	0	0
Wilson	130	0	0
Trawkarn & Bull	120	0	0
Devonport	106	0	0
Huckle	97	0	0
Wilcocks	75	0	0
Nash	75	0	0
Cater	75	0	0
Beresford	74	0	0
Jones & Wareham	68	0	0
Keyes	63	0	0
Hill	58	0	0
Seed (accepted)	48	0	0

For repairs to 28, Bedford-place, Russell-square. Mr. C. H. Edwards, architect:—

Hill	£180	0	0
Cater	135	0	0
Keyes	127	0	0
Wilson	118	0	0
Collins	117	0	0
Huckle	115	0	0
Moss	112	0	0
Seed	98	0	0
Beresford	95	0	0
Devonport	93	0	0
Jones & Wareham (accepted)	85	0	0

Here is a difference of opinion which could be explained in ten minutes' conversation.

J. W.

INTERMITTENT FILTRATION WORKS.

Sir,—In the observations contained in your last number, on the Intermittent Filtration Works, conducted by Mr. Bailey Denton, under an order of the Lords Justices, for the disposal of the sewage of Merthyr Tydfil, a printer's error states the daily dry-weather flow of sewage to be 60,000 gallons. The quantity should have been 600,000 gallons, the water supply being 12 gallons per head on 50,000 people.

The success that has hitherto attended the works has been remarkable, because 600,000 gallons of sewage have been daily applied for a month together to 10 acres of land only. It would, of course, have been much less remarkable had the quantity been limited to 60,000 gallons.

Bailey Denton, Son, & North.

SUBTERRANEAN TREASURES.*

MARBLE, ALABASTER, AND SLATE; PETROLEUM, ASPHALTE, AND JET.

"Nature," says Dr. Hartwig, "displays her wonders not only in the starry heavens or in the boundless variety of animal and vegetable life on the surface of our earth. In the dark regions underground she likewise shows us much that is remarkable or beautiful, or carries on gigantic operations, which are sometimes beneficent and sometimes disastrous to mankind. There lie concealed the mysterious laboratories of fire, which reveal to us their existence in earthquakes and volcanic explosions. There, in successive strata, repose the remains of extinct animals and plants. There many a wonderful cavern may be seen, with its fantastic stalactites, its rushing waters, and its noble halls. There have been deposited the rich stores of mineral wealth—the metals, the coals, the salt, the sulphur, &c.,—without whose aid man would never have been more than a savage."

An elaborate and interesting work in which are well described the wonders of this hidden world in their various relations to man, now raising him to wealth and now dooming him to destruction, has been written by Dr. Hartwig, the author of "The Sea and its Living Wonders," "The Harmonies of Nature," and other kindred works.

From this work we propose to condense a few of the exceedingly varied contents in order to show its scope and nature. It treats of geological revolutions, fossils, subterranean heat, upheavals and depressions, waters and wells, volcanoes, earthquakes, landslips, caves and the life and relics in them, tunnels, mines, metals, coal, bituminous deposits, salt, sulphur, amber and precious stones, quarries, rock temples, churches, and dwellings, tombs, and catacombs,—a goodly list of miscellaneous information, all well told and full of interest and value.

Besides metals, and the various minerals mentioned in the special chapters, the solid earth-rind, as the author remarks, furnishes an inexhaustible supply of marbles, slates, and stones for building or paving; and their extraction occupies a vast number of industrious hands. To these we shall first refer.

In a popular work on geology, published some years ago, Mr. Burat informs us that about 70,000 persons were employed in the 18,000 more or less important quarries at that time worked in France, and that the produce of their labour amounted to a value of more than 2,000,000*l.*

There can be no doubt that the quarries of England or Germany are at least equally productive, and thus a very moderate estimate leads us to the conclusion that the quarries of Europe, from those which furnish the costliest marble to those which yield the commonest building-stone, employ at least half a million of workmen, and produce an annual value of no less than 12,000,000*l.*, a sum which is probably doubled or trebled before the heavy materials can be placed in the hands of the consumer. A land ribbed with stone, like England, has therefore a considerable advantage over a flat alluvial plain, like Holland, as it possesses in its rocky foundations a source of wealth which nature has denied to the latter.

Though several other stones, such as granite and porphyry, are susceptible of a fine polished surface, and serve for the decoration of palaces and churches, yet marble or pure compact limestone is chiefly used for ornamental purposes, both on account of its beautifully variegated tints, and its inferior hardness, which allows it to be more easily worked. Our Derbyshire and Devonshire quarries supply a great variety of richly coloured marbles; but the best material for the sculpture is supplied by the limestone mountains of Carrara, which furnish a homogeneous marble of the purest white, with a fine granular texture, resembling that of loaf sugar. These far-famed quarries, which were worked by the ancients, having been opened in the time of Julius Cæsar, are situated between Spezzia and Lucca, in the Alpe Apuana, a small mountain-group no less remarkable for its bold and sharp outlines than for its almost total isolation from the monotonous chain of the Apennines, from which it is separated by a wide semicircular plain. Where the Alpe Apuana faces the sea, it is chiefly formed of magnesian and glimmer slate, in which large masses of limestone are imbedded; but the more inland part of the group belongs entirely to the limestone formation, and abounds in romantic scenery and noble peaks towering to a height of 6,000 ft. above the level of the sea. Towards its north-western extremity rises Monte Sacro (5,200 ft. in height), the famous marble mountain in whose slopes are scattered the quarries to which the small town of Carrara owes its ancient and world-wide celebrity.

The quarries themselves by no means afford an imposing sight, as they are mostly small, and very badly worked; but it is interesting to watch the transport of the huge blocks of superb material from the various glens in which the quarries are situated, while the numerous water-mills for cutting or polishing the marble enliven the whole neighbourhood.

In the town of Carrara numerous sculptors are constantly employed in rough-hewing the marble into various forms, such as capitals, friezes, busts, &c., in order to diminish the cost of transport, or to discover faults in the stone before it is shipped. There are also shops where marble trinkets or ornaments are exposed for sale; but Florence, Leghorn, and Genoa are the chief depôts of ready-made marble articles, such as vases, urns, sculptured chimney-pieces, and copies of renowned statues. Different kinds of fruit are also executed in marble, and with the aid of colour made to imitate nature so closely as to deceive the eye.

In Carrara the inferior qualities of marble are used for building and paving, as it is here the cheapest material. The window and door frames, the flooring and the chimney slabs, in even the meanest houses, are made of marble, and form a striking contrast to the squalid poverty of the remainder of the furniture.

* The Subterranean World. By Dr. George Hartwig. London: Longmans, Green, & Co. 1871.

The quarries which furnished the material for the finest works of the Grecian chisel partake of the interest which attaches to every vestige of ancient art.

About eight miles to the north of Athens rises the Pentelikon, or Mount Penteles, from whose flanks was excavated the marble that served for the construction of the Parthenon, of the Temple of the Olympian Zeus, and of the other matchless edifices of the Athenian Acropolis. No other quarries in the world can boast of their material having undergone a more beautiful transformation, for never has marble been more highly ennobled than by the genius of Phidias! The ancient roads ascending from the foot of the mountain to the quarries still show the traces of the sledges on which were transported the huge blocks of more than twenty tons in weight that now lie scattered among the ruins of the Acropolis.

Gypsum, or sulphate of lime, and the peculiar form of that mineral called alabaster, are substances of considerable importance in the arts. Rendered more valuable by a slight admixture of carbonate of lime, the gypsum of Montmartre, near Paris, has long been celebrated for its excellence as a cement or stucco. It is found resting on a limestone of marine origin, and in some places appears immediately beneath the vegetable soil, so that it can be readily and conveniently worked without having recourse to subterranean excavation. These quarries furnish the whole of northern France with the well-known plaster of Paris, and the value of their annual produce amounts to not less than 100,000*l*.

When sulphate of lime or gypsum assumes the opaque, consistent, and semi-transparent form of alabaster, it is worked like marble. The pure white and harder varieties are usually employed for the sculpture of statues and busts; while the softer kinds are cut into vases, boxes, lamps, and other ornamental objects. The alabaster quarries in the neighbourhood of the ancient Etruscan town of Volterra are the most famous in Europe, and have afforded employment for many centuries to her industrious population. Volterra exports her beautiful produce to all parts of the world, even as far as the interior of China. Beggary is here unknown (a rare case in Italy), for even women and children are all employed in cutting, sawing, rasping, or filing alabaster. In the remotest antiquity, when the city was still called Volathri or Volaterræ, this industry was practised within her walls, and a collection of sepulchral urns and other works of Etruscan art contained in the town-hall bears testimony to her ancient skill. Now, however, art seems to have degenerated into mere manufacturing ability; the statues and other objects are almost always repetitions of the same models, and but very rarely some speculative person introduces a novelty, for the purpose of obtaining a somewhat higher price for his wares.

Great Britain possesses apparently inexhaustible quantities of alabaster in the red marl formation in the neighbourhood of Derby, where it has been worked for many centuries. The great bulk of it is used for making plaster of Paris, and as a manure, or as the basis of many kinds of cements. For these common industrial purposes it is worked by mining underground, and the stone is blasted by gunpowder; but this shakes it so much as to render it unfit for works of ornament, to procure blocks for which it is necessary to have an open quarry. By removing the superincumbent marl, and laying bare a large surface of the rock, the alabaster, being very irregular in form, and jutting out in several parts, can be sawn out in blocks of a considerable size and comparatively sound. This stone, when preserved from the action of water, which soon decomposes it, is extremely durable, as may be seen in churches all over this country, where monumental effigies many centuries old are still as perfect as when they proceeded from the sculptor's chisel. The Derbyshire alabaster, commonly called Derbyshire spar, gives employment to a good many hands in forming it into useful and ornamental articles. Another kind of alabaster also found in Derbyshire is crystallised in long needle-like silky fibres, which, being susceptible of a high polish and quite lustrous, is used for making necklaces, bracelets, brooches, and other small articles.

Besides her inexhaustible coal, iron, and lead mines, Wales possesses in her slate quarries a great source of mineral wealth. For this article, which many would suppose to be but of secondary importance, is here found in such abundance and perfection as to command a ready market all over the world. Thus, in North Wales the face of the mountains is everywhere dotted or scarred with slate quarries, of which by far the most important and largest are those of Llandegui, six miles from Bangor, in which more than 3,000 persons are employed. This circumstance alone will give an idea of their extent, but still more their having their own harbour, Port Penrhyn, which holds vessels of from 300 to 400 tons, and whence slates are sent not only to all parts of Great Britain, but even to North America. The cost of the inclined planes and railroads which serve to transport the slates from the quarries to the port is said to have amounted to 170,000*l*. The masses of slate are either detached from the rock by blasting, or by wedges and crowbars. They are then shaped on the spot into the various forms for which they are destined to be used.

The class of bituminous minerals exhibits a long series of inflammable substances, which are supposed to be derived from the decomposition of organic matter in the rocks containing them. Some (petroleum—rock-naphtha) issue in a fluid state from the earth, while others pass by insensible gradations from petroleum into pittasphalte or maltha (viscid bitumen), and the latter as insensibly into the solid form of asphalte. Certain bitumens, again, differ but slightly in composition from bituminous coals, so that it is, in reality, very difficult to draw a decided line between them. Hence it is highly probable that in petroleum we see the product of a primeval vegetation which, under the influence of chemical change and heat, has partly assumed a liquid form, and oozing from the deep-seated strata in which it was confined by terrestrial revolution, now permeates the superficial rocks, or exists collected in subterranean cavities, whence it issues in jets and fountains whenever an outlet is made by boring.

Petroleum springs have been known for many ages in Burmah, where there are about 100 wells from 180 ft. to 306 ft. deep, each lined with horizontal tubes, but not all now worked; at Baku, in the neighbourhood of the holy fires, near the village of Amiano, in Parma, whence enough was formerly obtained to light the streets of Genoa; at Zante, one of the Ionian Islands, which has furnished oil for more than 2,000 years, its petroleum spring having been mentioned by Herodotus; at Agrigentum, in Sicily, which, according to Pliny, furnished a mineral oil that was collected and used for burning in lamps; on the banks of the Kuban, and many other localities; but it is only since the discovery of the immense sources of supply in the north-eastern States of America and in Canada that petroleum has become not only an article of the greatest commercial importance, but a blessing to millions in all parts of the world. It gladdens the long winter evenings of the Icelandic peasant, and enlivens the hut of the Australian settler; it has found its way into the remotest glens of the Alps, and to the distant sea-ports of China. No wonder that its economical and cheerful light has caused its consumption to increase with a rapidity almost without a precedent in the annals of commerce. Though scarcely ten years have passed since the American wells first began to pour forth their streams of oil, no less than 670,000,000 gallons were exported in 1866 from the ports of Philadelphia and New York. One-third of this enormous quantity found its way to England; one-fifth to the port of Antwerp, its chief staple place for Western Germany and the North of France; the remainder was distributed among all the sea-ports of the world from Hamburg to Hong Kong, and from the Cape to Valparaiso. When we reflect that this amazing mass of liquid bitumen, which formed the cargo of no less than 731 large vessels, must necessarily be increased from year to year to meet a constantly increasing demand, it might almost be feared that, in spite of the prodigality of nature, its subterranean reservoirs must one day be exhausted.

Asphalte, a mineral pitch of a deep black colour and a conchoidal brilliant fracture, is frequently found swimming on the surface of the Lake Asphaltites, or Dead Sea, in Judea, which receives its name from the circumstance. It also occurs in many parts of Egypt, where it was used for embalming. The ancients also frequently employed it, combined with lime, in their buildings. Not only do we find the ruined walls of temples and palaces in the East with the stones cemented with this material, but some of the old Roman castles in this country are found to hold bitumen in the cement by which their stones are secured.

"It is a remarkable fact," says the late Dr. Ure, "that the substance thus employed in the earliest constructions upon record, should for so many thousand years have fallen well-nigh into disuse among civilised nations; for there is certainly no class of minerals so well fitted as the bituminous, by their plasticity, fusibility, tenacity, adhesiveness to surfaces, impenetrability by water, and unchangeableness in the atmosphere, to enter into the composition of terraces, foot pavements, roofs, and every kind of hydraulic work. Bitumen, combined with calcareous earth, forms a compact semi-elastic solid, which is not liable to suffer injury by the greatest alternations of frost and thaw, which often disintegrate in a few years the hardest stone, nor can it be ground to dust and worn away by the attrition of the feet of men and animals, as sandstone, flags, and even blocks of granite are. An asphalte pavement rightly tempered in tenacity, solidity, and elasticity seems to be incapable of suffering abrasion in the most crowded thoroughfares; a fact exemplified of late in a few places in London, but much more extensively and for a much longer time in Paris."

Many of the asphalte pavements made in England have, indeed, proved failures; but as the proper proportions of the respective ingredients may not have been maintained, further trials are advisable. At present, although bitumen is employed, and with seeming advantage, as a cement between paving-stones, its use in the formation of foot pavement has been confined within narrow limits.

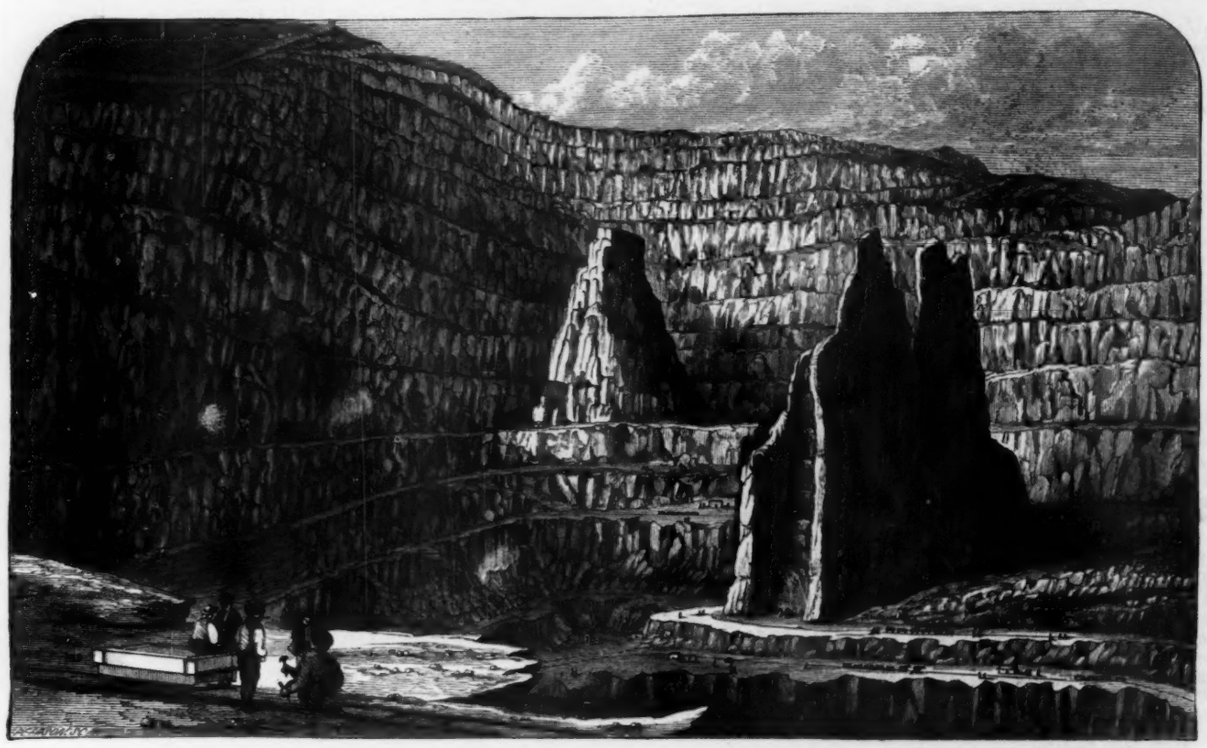
In Europe, the most extensive mine of asphaltic rock is undoubtedly that of the Val de Travers in the canton of Neufchâtel; but the most remarkable deposit of bitumen in the world is the celebrated Great Pitch Lake in the island of Trinidad. With regard to its formation, Sir Charles Lyell remarks that the Orinoco, which discharges its vast volume of water right opposite to the island, has for ages been rolling down great quantities of woody and vegetable bodies into the surrounding sea, where, by the influence of currents and eddies, they may be arrested and accumulated in particular places. The frequent occurrence of earthquakes and other indications of volcanic action in these parts lends countenance to the opinion that these vegetable substances may have undergone, by the agency of subterranean fire, those transformations or chemical changes which produce petroleum; and this may, by the same causes, be forced up to the surface, where, by exposure to the air, it becomes inspissated, and forms the different varieties of pure and earthy pitch or asphaltum so abundant in the island. The Pitch Lake is a mile and a half in circumference; the bitumen is solid and cold near the shores, but gradually increases in temperature and softness towards the centre, where it is boiling. The solidified bitumen appears as if it had cooled as the surface boiled in large bubbles. The ascent from the lake to the sea, a distance of three-quarters of a mile, is covered with a hardened pitch, on which trees and vegetables flourish, and the best pine apples in the West Indies, called black pines, grow wild. As the Trinidad pitch has been found by chemical analysis to be an excellent material for the making of gas, it will probably become an important article of commerce. The wonder is that it has been so long neglected.

Though jet is frequently considered to be wood in a high state of bituminisation, yet the fact that we find this beautiful substance surrounding fossils, and casing adventitious masses of stone, seems to show that a liquid, or, at all events, a plastic condition, must at one time have prevailed in its formation. This opinion is further strengthened by the circumstance that petroleum strongly impregnates the rock in which it is found, giving out a strong odour when it is exposed to the air.

Jet occurs chiefly in the neighbourhood of Whitby, in Yorkshire, the estates of Lord Mulgrave being especially productive. The jet miner searches with great care the slaty rocks, and finding the jet spread out, often in extreme thinness, between the laminations of the rock, he follows it with great care, and is frequently rewarded by its thickening out to 2 in. or 3 in.

At present the total annual value of the mourning ornaments made at Whitby and Scarborough amounts to no less than 125,000*l*. About 250 men and boys are employed in searching for jet, and between 600 and 700 are engaged in its manufacture.

Dr. Hartwig's valuable work is well illustrated, as an example of which we are enabled by the publishers to reproduce an engraving of Penrhyn Slate Quarry, North Wales. We must add, too, a word of praise as to the beauty of the paper and the excellence of the print, although a few printer's errors occur here and there throughout the volume.



VIEW IN THE PENRHYN SLATE QUARRY.

INTERIOR OF THE CATHEDRAL OF BOIS-LE-DUC, HOLLAND.

THE ORGAN-CASE.

Our illustration represents the interior of the nave of the cathedral church of Bois-le-Duc, in Holland, and shows the fine pulpit and organ, which are important features in that noble church.* As a musical instrument, the organ at Bois-le-Duc is second only to that at Harlem, but in point of architectural design, it has no rival in Holland, or perhaps even in Europe.

We take this opportunity of saying a few words upon church organs, not from a musical point of view at this moment, but from an architectural point of view. It strikes us as a very singular fact, that while so much has been done of late years to make the altars, pulpits, fonts, and other articles of church furniture beautiful and appropriate, no attention seems to have been paid to the organ, or rather the *organ-case*. In fact, the reverse seems to have taken place, for if we look at churches erected thirty or forty years ago, we find that the organ received far more attention, and was made a much more ornamental feature, according to the lights of the time, than in churches built within the last few years. In most of our modern churches the organ seems to be something beneath the notice of the architect, for he apparently considers that if he provides four posts and a few iron bars to tie the pipes together, he has entirely fulfilled his duty towards this article of church furniture. Now, we cannot understand why this should be the case. Why should an article of church furniture, which is deserving of the greatest study and consideration, be looked upon as a necessary encumbrance to be kept as much as possible out of sight, and made as unattractive as may be? There are two answers to this question, neither of which is in the least degree satisfactory. The first is, that so very few examples of ancient Gothic organs exist, that it is difficult to find authority for their design and arrangement in Gothic buildings; and the second is, that the modern practice of placing the organ out of sight in a dark hole at the side of the chancel, renders anything like a design unnecessary. The first of these answers is unsatisfactory, because, although there are very few old Gothic organ-cases in existence, those that *do* exist are very suggestive, and hundreds of superb Renaissance examples are to be found which any man of very ordinary capacity as a designer could easily "adapt" as the general "motive" of a Gothic production.

With regard to the second reason for neglecting the organ-case, we simply say this: the organ ought *not* to be stowed away in a dark hole,—an arrangement to be condemned both upon acoustic and artistic grounds. If it is absolutely necessary to have the organ near the east end of the church, why cannot some kind of transept be thrown out of the chancel, of sufficient height to allow the organ to be well lifted up above the floor? In larger churches the French arrangement might be adopted of having two organs, the great organ at the west end of the church, and a smaller one at the side of the chancel, over the stalls; and the new application of electricity to playing the organ would facilitate this arrangement, as by it both organs could be played by the same musician.

It may not be uninteresting to our readers to say a few words upon the ancient organ-cases still in existence, and some few which are mentioned in early writings.

In the Holy Scriptures the organ is mentioned eighteen different times. It is, however, obvious that this instrument was very small, and capable of being carried about. Organs are also mentioned by Pindar 500 years before the Christian era.

The first mention we have of an organ which must have been a large instrument, is one that is said to have been given to Charlemagne, and is reported to have made "*a noise like thunder.*"

The earliest organ mentioned as having existed in England was at Westminster Abbey, where there was one in the tenth century.

The first organ erected in Paris was at the church of St. Severin, in the year 1358, though they had been introduced into France as early as the third century. In the year 1463, the cathedral church of Toulouse had five organs, all on the rood-screen, which shows that even up to that period the instruments were generally small.

The earliest organs now existing date only from the end of the fifteenth or commencement of the sixteenth century. Those in the cathedrals of Chartres and Amiens are of this date, and in the churches of Perpignan, Honblieux in Picardy, Moret, Clauncy, St. Bertrand des Commignes, and Solies-Villes, in France; also those at Strasbourg, Nördligen, and St. Anne's, Augsburg, in Germany.

All these examples are elaborately carved and adorned with gilding and colour; they are also supplied with doors richly painted. Those of Honblieux and Perpignan are of large size and complicated arrangement.

The organ at St. Anne's, Augsburg, consists of a great organ and choir-organ, both of which have superbly painted doors. Those of the great organ are painted by the elder Holbein, and those of the choir-organ by Burgkmayer. At Gonesse, in France, is a beautifully designed organ-case of Early Cinque-cento work, which has never had doors: it bears the date 1508.

The organ in the church of SS. Afra and Ulrich, at Augsburg, bears the date 1600 upon it. It is in the Renaissance style, but has finely painted doors; the subjects upon which are the Annunciation and the Assumption of the Virgin Mary. The superb organ at Bois-le-Duc dates from the year 1602. The case is entirely of dark oak, and is not coloured.

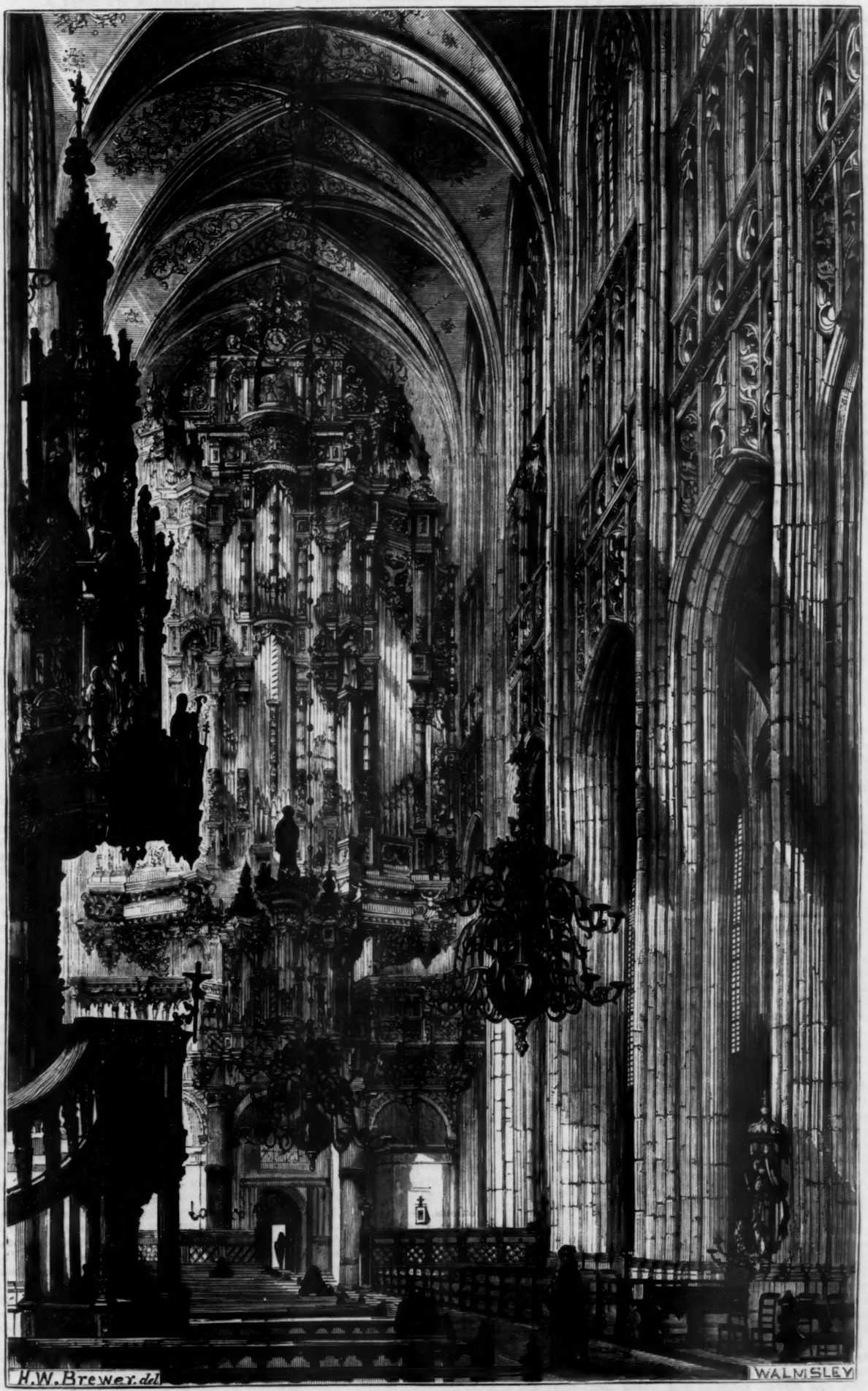
In England we know only of one organ-case which may date from before the Reformation. It is in Northamptonshire. A small Renaissance organ, beautifully decorated, is to be seen in the chapel of Hatfield Hall. It is a work of the first quarter of the seventeenth century. Renaissance organ-cases of great beauty, in their way, are also to be seen at King's College Chapel, Cambridge, and St. Peter's, Mancroft, Norwich. The old organ-case at St. Paul's Cathedral is a work of Grinling Gibbons, and though rather wild, is a fine example of the work of that period.

During the earlier years of the Gothic revival, considerable attention was given to the organ-case, and some of those designed during that period were of considerable merit, especially that at St. George's Chapel, Windsor, which is exceedingly well treated, particularly the arrangement of the "choir organ."

At Jesus Chapel, Cambridge, is a charming little organ, designed by Pugin, with doors well painted. The fine design which he made for an organ to stand on the rood-screen at Ushaw College was unfortunately never carried out.

The organs at Ely Cathedral and St. Mary's, Nottingham, are so satisfactory as to make us wish that Mr. G. Gilbert Scott would give us some more examples of his skill in designing this noble article of church furniture. Before concluding this article we may mention that many valuable hints upon the design and arrangement of church organs will be found in Mr. Sutton's work, which is rendered the more useful by the fact that it is excellently illustrated, and we recommend all those who are likely to have anything to do with church organs to look to it.

* View of the exterior will be found in our volume for 1870, p. 107.



INTERIOR OF THE CATHEDRAL OF BOIS-LE-DUC, HOLLAND: SHOWING THE ORGAN.

INTERIOR OF THE CATHEDRAL OF BOIS-LE-DUC, HOLLAND: SHOWING THE ORGAN.

A VISIT TO DOLGELLY, OWEN GLANDWR'S PARLIAMENT HOUSE, Y VANER ABBEY, &c.*

Sir R. C. Hoare asserts that there is "no place in the Principality from whence so many pleasing and interesting excursions may be made, and where nature bears so rich, so varied, and so grand an aspect as Dolgelly." So far true, nature reigns triumphant. Now, as for art and civilisation, we may correctly state that there is no town in Wales which possesses less art, or exhibits so small an amount of civilisation, as regards the comforts of sanitary matters, as the town of Dolgelly; the eye proves the former assertion, and the nose the latter. The people, however, have improved since the time of Dr. Fuller, who reported, in his "Worthies of Wales," "that there are more ale-houses than houses:" temperance hotels are now prevalent.

Nature, in sanitary matters, is by far superior to man; the mountain homes, without closets and cesspools, are more wholesome than closets without drainage. The vast quantity of rainfall from the mountains in Wales is surprising, and it not only might be collected with great sanitary advantage, but would also protect the population, principally living in the valleys, from a complete and constant saturation, engendering rheumatism, typhus fever, whooping-cough, &c., now very prevalent in many parts of Wales. On this head there is still much to be done throughout the country, notwithstanding the earnest and powerful efforts which have from time to time been made in the *Builder*.

It affords relief, as usual, to turn attention to the works of bygone ages, when the mind held an ascendancy over manual labour. In Parliament-street is situated Owen Glandwr's Parliament House; the guide-book announces it as "the most interesting object in the town." This is undoubtedly correct as far as relates to the old and picturesque building in question, and the absence of any other antiquities. The house appears to be of the early part of the fifteenth century, and to have been constructed of timber and plaster, similar to buildings of that period. The upper story projects over the ground story, and the windows are in three lights, and are projected on moulded sills; some of the mouldings have flowing foliated carvings. The photographer has shown the front with the stone steps leading to the upper room,—the so-called Parliament House. If a view were to be taken of the back, it would be more interesting to the architect, as it possesses more ornamentation. With some difficulty permission was obtained to enter the rooms, the house being now divided into small apartments, and let to poor people. The armoury, so-called, tenanted by a shoemaker, is 19 ft. by 13 ft., with an open timber roof. As an old English house, in a ruinous state, it is an interesting object; but as a Parliament House for the Principality, at any period, it is, and ever has been, more suitable for Guy Vaux and his confederates, than for the reception of enlightened Welshmen.

The church is a large ugly edifice, on an eminence in the midst of the town, having no architectural pretensions in either the interior or exterior. In a popular guide-book the church is absurdly described as a neat and substantial structure, with a fine square tower, built of limestone, in the "Grecian" style of architecture. With the exception of a monument to an ancestor of the Vaughan family, and a few recent monuments, there is not anything noticeable. The county-hall has a pediment, with cantilevers, and on the front of the building are pilasters, with clumsily-moulded capitals supporting nothing, there being no entablature or architrave. The new market-hall, erected last year, is an improvement to the town; it is built with Surglas blue stone and Craigwen stone, obtained from the neighbourhood. The archivolt mouldings, dressings to windows, string-courses, &c., are of Ruabon freestone. It has not any architectural character, being without cornices. The roof is slated and supported by cantilevers. All the buildings in the town are of stone, slated.

The bridge over the Wndion is crossed by a stone bridge, erected in 1638, repaired and enlarged in 1830, two arches being added; and in 1868 it was again raised and altered, to enable the Great Western Railway Company to form their line under it. The grammar school is of stone, slated, and was erected in 1852. The national school, recently built, in the Mediæval style, on the north side of the bridge, appears to advantage.

The whole of the buildings in the town are square and heavy, most unsightly and unpicturesque. The country being mountainous and romantic in the extreme, demands buildings in a style suitable to the situation; high-pitched roofs, gables, &c., based upon the Swiss and other Alpine styles, adapted to snow storms and rough weather. The chief town of Merioneth, although irregularly built, is surely worthy of attention. Banish the cesspools and smells, form a few footpaths, and render the town better fitted for human beings.

A short distance to the right of the road from Dolgelly, just before reaching Llanelltyd-bridge, an avenue of sycamore trees leads to the farm in which are the remains of a Cistercian abbey, called by the Welsh, Y Vaner, and by different authors Cymmer, Cymner, Cwmner, Kimmer, Kinner, Kinmer, and Kimner. It is dedicated to St. Mary, and was founded by Meredith and Griffith, sons of the Prince of North Wales, in the year 1198, and dissolved by Henry VIII. Lewis Morris (quoted by Bingley), says "it was first founded by some monks, who sojourned there from Cwm hir Abbey, in Radnorshire. It seems it was a colony of monks sent away, as bees do when the hives are too full." The abbey had a narrow escape in 1231; Henry III. was outwitted by the Welsh, and ordered the whole building to be destroyed. He, however, contented himself by burning the out-offices, and receiving from the abbot 300 marks. It is in the Early English style of architecture, the remains being carefully preserved. The abbey church is small and unique, and consists of a nave and chancel; the nave had formerly north and south aisles. The internal dimensions are 123 ft. 2 in. by 25 ft. 10½ in., without the former aisles. The east end contains three deeply-splayed lancet windows, with interior edge shafts and capitals; external width of opening about 1 ft. 4 in.; internal width, 4 ft. 2 in.; the central light is wider. In the south wall of the chancel are three sedilia, on the same level. The columns have ornamented capitals and bases, partly of a Norman character; there are separate pointed arches internally. A pointed recess, usually containing the founder's tomb, and a single piscina and aumbrye, are contiguous eastward. Westward of the sedilia is a pointed doorway, blocked up with angular columns and ornamental capitals. On the north side of the chancel is a large pointed and moulded archway, now filled up, formerly probably connecting a chapel, and a modern square-headed doorway. The nave was separated from the north aisle by two columns and two responds, which are octagonal, with moulded capitals, supporting three pointed arches. The arches are chamfered and plain, with two courses of voussoirs. These openings are now closed with masonry, and farm buildings have been erected on the site of the former aisle. On the south side the columns, arches, and aisle have disappeared. The side walls remaining are about 30 ft. high. The west doorway has a horizontal stone lintel over it. Above the doorway is a small trefoil-headed window; and on each north and south side at the west end is a deeply splayed and pointed window. In the church, by the north-west angle, is a large sycamore tree. A stone staircase appears to have been in the north-west angle. The remains of the west front are about 35 ft. high, with diagonal buttresses. All the walls are covered with ivy. The walls of the abbey are constructed with the blue local slaty stone, and the columns, voussoirs, quoins, string-courses, &c., are of wrought freestone. The orientation is 9° to the north of east.

A short distance westward of the abbey church stand the refectory and abbot's residence; these are attached to an adjoining house, and let to lodgers. The refectory was originally 34 ft. by 20 ft. 5 in.; it is now reduced in length to 25 ft. 3½ in. by a bedroom and lobby at the south end. At the north end is a doorway formerly leading to the "black parlour." The walls are 3 ft. 2½ in. thick, and the windows splayed, with lead quarry lights. The roof is an open span, with collars, foliated purlin braces, &c. The chimney-opening is 9 ft. 9 in. In the south-west angle is a small gallery. Westward of the refectory, but not connected, are the farm buildings.

Within one mile from the abbey is Llanelltyd Church; it is dedicated to St. Illyd, and consists of a nave, chancel, two porches, and a bell-turret at the west end containing one bell. The roof is a span without any marked division between nave and chancel; the length of the church is 52 ft. 7 in., and the width 20 ft. 1 in. The east window is in two lights, the windows in the north and south walls are modern insertions. At the west end is a modern gallery. On the back of each seat is painted the name and address of its occupier. Against the east wall of the chancel is a mural monument to Sir Robert Howel Vaughan, of Hengwrt and Nannau, bart., who died October 13, 1792. It consists of a white marble tablet, with a flat grey pyramidal stone on the same, with a Roman Doric column, broken and falling, in relief upon it. The pulpit stands against the east wall, but not within the altar-rails; the reading-desk is in the south-east angle. The altar is inclosed with twisted balusters, and paved with encaustic tiles, with a modern brass cross inlaid. In the north-east angle of the chancel are some remains of old oak panelling. The font bears the date of 1689. It is of stone, and octagonal, 1 ft. in diameter, with water drain. This font, a mere basin, used to stand in the old font. It is now mounted on an octagonal pedestal, and fixed against a post supporting the west gallery. The north porch was erected about 1841. The south porch is ancient. In this the old font is preserved, but not now used. It is of stone, circular in form, and 1 ft. 6 in. in diameter. The singular custom of suspending plates against the walls, resembling those usually affixed on coffins, is here retained. They are in memory of William Williams, John Edwards, John Owen, Jane Vaughan, &c. The church is lighted by turned wood slender stands, with brass sockets, and tallow candles. The south porch inner door is said to have been removed from Cymmer Abbey; if so, it is of a more recent date than the abbey, being of the fourteenth century. The lock is 1 ft. 9 in. long by 8½ in.

Returning to Corwen, and proceeding a few miles north of Rug, is an ancient church at Gwyddilwern, well worthy of a visit, especially as it will be either rebuilt or modernised within a short period. The church consists of a nave, chancel, south porch, and a bell-turret at the west end, containing two bells. The nave windows are Perpendicular, in three lights, with trefoiled heads. Large iron hooks are in the external jambs, formerly used for shutters. The gallery at the west end is curious, the front being panelled, with buttresses. It bears the date of 1634, and an inscription written in Welsh, "Gabriel Hughes," and a quotation from Proverbs xi. 27. In the north wall are recesses, with doors, containing the registers. The font is Perpendicular, octagonal, with a shaft, 2 ft. 8 in. in height, and 2 ft. 5 in. across the top, exclusive of base-stone, with a copper lid. It stands against the south wall, by the porch door. The pulpit is octagonal, and panelled. It stands in the north-east angle of the nave. On the reading-desk is a Latin inscription, recording it as the gift of Robert Davis, for the use of the parish, the upper panels have dragons carved out of the solid. The seats are of various periods. There are ancient benches, with solid ends. Towards the east end of the nave the seats have carvings of pelican and young, oak-leaves, acorns and birds, lilies, &c.; and some modern pews have the dates of 1705 and 1743 upon them. The church is lighted by an oil-lamp suspended from the roof. The old chandelier is a curiosity, now not used. It lies under the gallery; is of wood, with two tiers of imitation candles suspended from a circular frame, similar to those in a chandler's shop. Above these are wooden sockets, arranged on the frame, in which candles were formerly put; the whole being surmounted by wooden angels, with red faces, blue wings, &c., in the best style of country polychromy. Jones, vicar, is, of course, painted on the chandelier, without date. The paving of the nave is composed of memorial stone slabs, dates 1754, 1780, &c. On the north wall of the nave is a mural tablet to the Rev. Edward Roberts, Vicar of Whitford, Flint, date 1839. Also an old board, with benefactions written in Welsh. Painted on the north and south walls are wreaths, with quotations from Matthew xii. 36, and Mark x. 14. The old oak chest under the gallery is formed out of the solid, the lid is bound with ironwork, and has three padlocks. The length of the nave from the chancel-screen to the west end is 54 ft. 2 in.; width, 24 ft. 1½ in. In the north wall is a doorway, now blocked up. The nave-walls are 2 ft. 8 in. thick. The chancel is separated from the nave by an ancient screen. The lower part contains carved and pointed foliated panels, with quatrefoils in the angles. The upper part of the screen has been cut

* See vol. xxii., p. 718; vol. xxiv., p. 609; and vol. xxvi., p. 709.

down. The original height can be traced on the walls. The roof is open, and similar to that of the nave, except over the altar, which has been ceiled, and the barbarians have claimed notoriety for their act, by painting the following inscription on the roof:—"Plastered by Ellis Davis: Humphrey Peirce, Thomas Hughes, churchwardens, 1730." The date of the chancel is of the fourteenth century; the side windows have two lights pointed; in one is stained glass. The east window is Perpendicular, in five cinquefoiled lights, with transom and remains of stained glass in head of window. On the south side is a priest's seat of wood, with canopy of late date. The altar is raised one step, and enclosed by a balustrade. Beneath the east window is written in Welsh an exhortation from the Holy Communion. The benches are original, with solid ends. On one is "J. M. M., esq.;" on others brass plates, with the names of the owners. Against the east wall is a veined marble classic monument to William Humffreys, 1718, with open pediment and arms on shield in centre. On the south wall are coffin plates in memory of John Humphries, 1824, and the Rev. John Jones, vicar, 1829; and a slate slab to Thomas Hughes, of Clegir, 1691. Attached to the north wall are coffin-plates to John J. Jones, 1829; and Edward Hughes, 1830; and a brass in an oak frame to Catherine Mostyn, of Ddynas, 1703. The decalogue is painted on the north wall of chancel, and the creed on the south wall of nave, with the Royal arms, date of George II., on the north wall. On the same wall is a quotation from Acts xi. 2. The chancel in length is 26 ft. 11 in., the width being 19 ft. 6 in. On the south side is a doorway. Externally the west front was originally built partly battering; the south wall of chancel is 1 ft. out of the perpendicular, and the porch appears to be giving way. The orientation is about 4° to the north of east.

There are more old churches in North Wales sequestered in the mountains well worthy of being recorded; they will before many years are past be modernised or swept away.

Turning from the ancient to the modern, from the church to the chapel, mention may be made of the new mountain chapels. The supineness of the church in former times, and in the present period, has led to the erection of many dissenting chapels on the mountains throughout Wales, which are often miles from towns, and even villages. The cost of building varies according to the size and decoration of each chapel, say from 200*l.* to 800*l.*, and even more. These prices do not include stone, sand, or carriage; the farmers supply the latter; the timber, slates, lime, and labour, have to be paid for. A mountain chapel is nearly completed on Mynydd Hirathog; the slates were procured from Penmachno, and the stone and sand from the locality. Another chapel is being erected near Rug, with dwelling-house attached, at a cost of 400*l.* The stone is from Berwyn; the tooled sills are from Ruthin; the timber and rough sills from Corwen; the red and white bricks from Ruabon; and the slates from Llansaintfraid. The walls are 2 ft. 3 in. thick. The internal dimensions of the chapel are 35 ft. 6 in., by 29 ft.; parlour, 16 ft. square; vestry, 16 ft. by 12 ft. 8 in., with bed-rooms over. A chapel at Maedy, recently completed, possesses an architectural character, and the dwelling-house is more appropriately placed at the side, instead of at the end, as a chancel. At Rhydlydan, near Pentre Foelas, a chapel is being finished at a cost of 500*l.* And at Gwyddilwern another chapel has been built for about 600*l.*

No doubt, that when the railways penetrate the valleys they will extend civilisation, and induce the preachers to make the dwelling-house or vestry detached, or at least place it at the side of the chapel, instead of building it at the end as they now do, giving it the appearance of a chancel, only with this difference,—they finish one end of their chapel with a short freestone pinnacle, and the other end with a chimney and pot, in lieu of a cross or more suitable decoration.

The Church cannot compete with these earnest and persevering preachers, unless it establishes a Great St. Bernard, with a staff of mounted curates, with prog in one pocket and a Bible in the other.

W. P. Griffith.

London Institution.—The first evening lecture, "Michael Faraday: the Story of his life," by Mr. J. H. Gladstone, F.R.S., will be given on Thursday, November 2nd.

NEW BUILDINGS AND IMPROVEMENTS IN OXFORD.

With the commencement of the academical year, according to annual custom, a review of what has been done in Oxford during the past twelve months in the way of new buildings and the restoration of old ones is given by the local *Journal*. The only works of importance in the University are the restoration of the Cathedral and All Souls' Chapel. An important work has nearly been accomplished in the western part of the city in the erection of a church in the populous district of Osney. The only other public buildings that have been erected during the past year are schools in the parishes of Cowley Saint John, Trinity, and Saint Ebbe's. Houses of various sizes still continue to be built, and villas on the Norham Manor estate.

Christ Church.—The work of restoring the Cathedral is still going on. Some portions which were first undertaken have been completed, and others are in rapid progress. The interior stonework has been cleaned and made good. The east-end wall has been rebuilt, and two Norman windows, similar to the old ones, have been placed in, with a large rose window and arcade above. A three-light memorial window has been erected in the Dean's Chapel by Messrs. Morrison & Co., of London. The floors of the nave, chancel, and south aisle have been lowered to their original levels, and the two former have been laid with marble. The south transept has been restored to its original form. The mutilated windows in the aisles, chapels, and transepts have been restored, and the monuments which disfigured the pillars have been removed to other and better situations. The tower is also undergoing a thorough renovation. The architect is Mr. Gilbert Scott, and the builder Mr. Symm.

All Souls' College.—The chapel and ante-chapel of this college are undergoing a restoration. The decayed stonework in the exterior of the walls has been replaced with new Bath stone, and new jambs, mullions, and tracery-work of the Gothic windows have also been renewed. The buttresses have been taken down and rebuilt also in Bath stone, and the whole of the pinnacles, parapets, and copings are rebuilt in Ketton stone. The windows will be filled in with the old glass. In repairing the walls in the lower portion of the chapel on the south side, the original entrance to the crypt was discovered. It was built up with ashlar stonework, and no trace of it could be seen from the outside. The work of restoration is being carried out by Mr. Kimberley, builder, Banbury. The architect is Mr. Clutton, of London.

Magdalen College and School.—Various alterations, improvements, and repairs have been effected at this college during the past year. A new class-room, 46 ft. long and 18 ft. wide, has been added to the school. It is connected with the school-building by a corridor, 24 ft. long and 13 ft. wide. The style of the architecture corresponds with that of the school. The walls are built with Bath stone, surmounted by an embattled coping, and cased on the inside with bricks. There are four buttresses on the east, and five on the west side. In the class-room the walls are wainscoted about 4 ft. from the floor, and stuccoed above. There are three windows on the west, two on the east, and one at the north end of the room, and they are all glazed with quarry glass. The roof is of deal timber, and is open to the ridge, and covered with Stonefield slate, with a red-tile crest. The whole of the work is being carried out by Messrs. J. Castle & Co. The class-rooms and corridor were built from the designs of Mr. Buckeridge.

Trinity College.—All the old cesspools have been filled up, and large pipe-drains have been laid throughout the building in connexion with the town sewer. The work has been satisfactorily carried out by Messrs. Wyatt & Son.

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The old police-station at Carfax has been converted into a shop.

Some houses have been erected in St. Aldate's on the site of those which were destroyed by fire about a year and a half since.

One or two more villas have been added to those in South Parks-road, the end one having been erected by Messrs. Castle & Co.

A number of detached and semi-detached villas have been built on the Norham Manor estate. Several shops and private residences have been built in Hythe Bridge-street; and a number of houses have been erected in Cowley St. John district, Walton-street, and Kingston-street.

New school-rooms for boys and girls have recently been erected at South Hinksey: they will accommodate about 180 children.

We understand that an arrangement is in progress for providing a new boys' school for the district of St. Barnabas. It is estimated that about 1,000*l.* may be required for this purpose.

THE TRADES MOVEMENT.

Newcastle-upon-Tyne. — There were twelve engineering firms in Newcastle and Gateshead, whose men left their works upwards of twenty weeks ago, and nine of these firms made such arrangements on Thursday in last week, as would enable their old hands to recommence work either immediately or within a few days. Sir William Armstrong & Co., Messrs. Abbott & Co., and Messrs. Clark, Watson, & Gurney had not yet arrived at an understanding with the men that were out as to the time for recommencing work. The only hindrance to the men getting into full employment was, that a number of castings which had been in stock when the strike commenced had been worked up, and before the firms could give employment to all their former hands it was necessary that some of the earlier stages of their work should be somewhat advanced. It was unreasonable to expect that 2,000 men at an hour's notice could all resume their old places in factories at which operations had been more or less suspended for five months. Most of the employers, according to the reports of the delegates, behaved very considerately to their old men. Messrs. G. R. Stephenson & Co. have granted the nine-hour day's work, from 1st November, to their men, none of whom turned out with the strike. This announcement in the factory caused great rejoicings among the men, who went out in procession with their band, and at the base of George Stephenson's monument a resolution of thanks to Mr. George Robert Stephenson was carried with great cheering.

Messrs. Palmerston & Co. (limited), at Jarrow, have conceded the nine hours to the men in their extensive engine works, which arrangement, it is stated, will come into action immediately.

The central committee of Amalgamated Trades of London have addressed their fellow workmen as to the Newcastle struggle. They say,—

"An impression is abroad that all is over. We desire to state such is not the case. Unfortunately employment cannot be found for the old hands for a few weeks, until the firms have got their arrangements complete again after the long cessation caused by the struggle; therefore we hope that after sacrificing so much on their part, you will not let these good men want that support which you have so nobly seceded to them during their protracted struggle. We have to state, there are 800 men and their families to provide for; and also 1,500 foreign workmen left in Newcastle. Great numbers of these men are desirous to go to their homes. We consider it to be our duty to assist in clearing our country of them, and prevent them remaining any longer than can be avoided."

Seventy-five foreigners left Elswick Works in one morning last week, and at the other works great numbers have left. Others are preparing to leave, so that it appears likely that very few will be in the factories this week.

Leeds. — A deputation of the master and operative plumbers of Leeds have met to discuss the claims for an advance of wages and shortening of hours, put forth by the workmen, when the following resolution was unanimously agreed to:—"That for the future fifty hours shall constitute one week's work, and the rate of wages for efficient workmen shall be 6¾d. per hour, and that work be commenced at half-past seven in the morning, with no stoppage for breakfast."——To the surprise and pleasure of their 3,000 work-people, Messrs. Greenwood & Batley, machine-makers, of Leeds, issued a notice, announcing that on Monday they would adopt the nine-hours system, without any reduction of wages. This concession has been made without any movement on the part of their hands.——Messrs. Fairbairn, Kennedy, & Naylor have issued notices that the working hours at Wellington Foundry are reduced to fifty-four per week, without a reduction of wages.

Hartlepool. — The nine-hours principle has been conceded to the workmen in the Middleton Ironworks at Hartlepool. A reduction of the hours of labour has also taken place in the locomotive carriage works of the Great Western Railway.

Middlesbrough.—Mr. Thomas Hughes, M.P., the arbitrator appointed by the North of England Board of Arbitration and Conciliation for the Iron Trade, has met the Board. In July last he awarded the iron workers an advance of 5 per cent. Mr. Hughes was, however, requested to reconsider his decision, on the plea that the trade returns upon which it was based were incorrect. These returns having been verified by Mr. Waterhouse, accountant, Mr. Hughes confirmed his award of July, and explained his reasons at some length. Several representatives of the men and the employers took part in the discussion, and it was finally suggested that in future the wages should be regulated by the market prices. The question was deferred for settlement.

THE FIRE AT CHICAGO.

Wonder has been felt and expressed at the frightful spread of the fire at Chicago. The existence of raised footpaths of wood has been pointed to in explanation. Mr. J. O. Heyworth, of Pewtree, West Derby, gives a more probable cause. That gentleman writes,—"We naturally exclaim, could a fire, in this age of large stone churches, walls, and brick houses, &c., sweep all before it? Surely it must have been diverted here and there in its terrible path of destruction by stone and mortar? Such would happen in any English town, but the secret of Chicago's disaster, actually within her own established free limits, where wooden houses are prohibited being built by law, lay in the almost universal absence of slate roofs. Owing to the great expense of slates, caused by tariffs in favour of some miserable specimens of slate quarries in the State of Pennsylvania, we are, in fact, compelled to roof our houses either with wooden shingles or with tar felt paper, swabbed over with melted pitch, and then strewn over with small gravel.

The heat of the sun causes the gravel in many places to sink into this pitch and expose it, as also where the paper is turned up against the interior of the outside walls, which always exceed the height of such a kind of nearly level roof as used to be the case with the roofs of old Jerusalem, which were more safely paved with stone slabs in those ancient days of careful building and small progress. In Chicago, therefore, how hopeless when once a fire had got beyond the immediate control of the fire department to expect that a stone or brick building would stop or divert the raging flames, while their almost flat roofs of wood and pitch were ready to catch the falling embers, carried along and fanned into flames by a fierce and unrelenting gale."

THE DISSOLUTION OF A BOARD OF GUARDIANS.

A sealed order was received last week at Mill-street Union, Cork, from the Poor Law Commissioners, intimating that the Commissioners would forthwith proceed to appoint paid guardians, the elected guardians having failed to discharge their duties. The great irregularity of the meetings of the guardians, who never attended in sufficient numbers, and who continued deaf to all remonstrances on the part of the Commissioners, has led to these steps being taken. The interests of the poor suffered heretofore, and the rate-payers will henceforth feel the screw, in not only being obliged to contribute to the support of the poor, but to the necessary means for the payment of the new guardians. It is some years since this extreme course has had to be adopted in the sister kingdom before; though there are occasions, even in the metropolis, where it might be resorted to with effect. Boards of guardians ought to be warned in time of the latent powers that may be employed to relieve them from the duties they so negligently discharge, and rate-payers should also be careful that their representatives are not drifting, in many districts, into a course of action, or rather inaction, that will render it necessary for the Local Government Board to send their ukase forth.

ENLARGEMENT AND EXTENSION OF THE BOROUGH-ROAD SCHOOLS, LONDON.

The training-school or college for students in the Borough-road, in connexion with the British and Foreign School Society, has just undergone a considerable enlargement in order to provide accommodation for an increased number of students. The height of the building, which is 170 ft. long, has been increased to its entire length by an additional elevation of 18 ft. Red brick, with yellow brick facings, have been used in the construction of the enlarged building, rendering the new portion uniform with the rest of the structure. The windows are circular-headed, with a pediment-headed window in the main centre, and at the extremity of the west wing a square tower has been carried up from the first floor to a height of nearly 20 ft. above the main body of the building. The interior of the additional story is intended to be set apart exclusively for dormitories, of which there will be thirty in number, for the increased students about to enter the establishment. Simultaneously with the increased elevation of the building a considerable portion of the interior has also been re-arranged.

The architects for the new works are Messrs. Beck & Lee, of Finsbury-circus; Messrs. Brown & Robinson, of Finsbury, being the contractors.

CONDITION OF LEICESTER.

PHOSPHATE SEWAGE PROCESS.

Sir,—I am desirous of confirming the very practical remark with which you conclude your description of this process at Leicester in your number of the 7th inst. You observe that "as this highly-organic precipitate is allowed to accumulate at the base of the tanks for weeks and months, secondary decomposition sets in. The generating gases rising to the surface counteract the good effects of the superior gravity of the precipitant," and "the supernatent water becomes charged with foul matter that passes off with the effluent water contaminating it with anterior sewage."

I have for the last four years been advocating,—as you may know, having given place to some of my remarks on the subject,—the separation of the solid parts of sewage from the fluid before they were decomposed and disintegrated; perfectly convinced that no effluent water could be brought to a sufficient degree of purity after they had been allowed to dissolve and decompose in it.

The Improvement Commissioners of Surbiton, in Surrey, have allowed me to experiment on a sewer in that town, and selected one under a

down. The original height can be traced on the walls. The roof is open, and similar to that of the nave, except over the altar, which has been ceiled, and the barbarians have claimed notoriety for their act, by painting the following inscription on the roof:—"Plastered by Ellis Davis: Humphrey Peirce, Thomas Hughes, churchwardens, 1730." The date of the chancel is of the fourteenth century; the side windows have two lights pointed; in one is stained glass. The east window is Perpendicular, in five cinquefoiled lights, with transom and remains of stained glass in head of window. On the south side is a priest's seat of wood, with canopy of late date. The altar is raised one step, and enclosed by a balustrade. Beneath the east window is written in Welsh an exhortation from the Holy Communion. The benches are original, with solid ends. On one is "J. M. M., esq.;" on others brass plates, with the names of the owners. Against the east wall is a veined marble classic monument to William Humffreys, 1718, with open pediment and arms on shield in centre. On the south wall are coffin plates in memory of John Humphries, 1824, and the Rev. John Jones, vicar, 1829; and a slate slab to Thomas Hughes, of Clegir, 1691. Attached to the north wall are coffin-plates to John J. Jones, 1829; and Edward Hughes, 1830; and a brass in an oak frame to Catherine Mostyn, of Ddynas, 1703. The decalogue is painted on the north wall of chancel, and the creed on the south wall of nave, with the Royal arms, date of George II., on the north wall. On the same wall is a quotation from Acts xi. 2. The chancel in length is 26 ft. 11 in., the width being 19 ft. 6 in. On the south side is a doorway. Externally the west front was originally built partly battering; the south wall of chancel is 1 ft. out of the perpendicular, and the porch appears to be giving way. The orientation is about 4° to the north of east.

There are more old churches in North Wales sequestered in the mountains well worthy of being recorded; they will before many years are past be modernised or swept away.

Turning from the ancient to the modern, from the church to the chapel, mention may be made of the new mountain chapels. The supineness of the church in former times, and in the present period, has led to the erection of many dissenting chapels on the mountains throughout Wales, which are often miles from towns, and even villages. The cost of building varies according to the size and decoration of each chapel, say from 200*l.* to 800*l.*, and even more. These prices do not include stone, sand, or carriage; the farmers supply the latter; the timber, slates, lime, and labour, have to be paid for. A mountain chapel is nearly completed on Mynydd Hirathog; the slates were procured from Penmachno, and the stone and sand from the locality. Another chapel is being erected near Rug, with dwelling-house attached, at a cost of 400*l.* The stone is from Berwyn; the tooled sills are from Ruthin; the timber and rough sills from Corwen; the red and white bricks from Ruabon; and the slates from Llansaintfraid. The walls are 2 ft. 3 in. thick. The internal dimensions of the chapel are 35 ft. 6 in., by 29 ft.; parlour, 16 ft. square; vestry, 16 ft. by 12 ft. 8 in., with bed-rooms over. A chapel at Maedy, recently completed, possesses an architectural character, and the dwelling-house is more appropriately placed at the side, instead of at the end, as a chancel. At Rhydlydan, near Pentre Foelas, a chapel is being finished at a cost of 500*l.* And at Gwyddilwern another chapel has been built for about 600*l.*

No doubt, that when the railways penetrate the valleys they will extend civilisation, and induce the preachers to make the dwelling-house or vestry detached, or at least place it at the side of the chapel, instead of building it at the end as they now do, giving it the appearance of a chancel, only with this difference,—they finish one end of their chapel with a short freestone pinnacle, and the other end with a chimney and pot, in lieu of a cross or more suitable decoration.

The Church cannot compete with these earnest and persevering preachers, unless it establishes a Great St. Bernard, with a staff of mounted curates, with prog in one pocket and a Bible in the other.

W. P. Griffith.

London Institution.—The first evening lecture, "Michael Faraday: the Story of his life," by Mr. J. H. Gladstone, F.R.S., will be given on Thursday, November 2nd.

NEW BUILDINGS AND IMPROVEMENTS IN OXFORD.

With the commencement of the academical year, according to annual custom, a review of what has been done in Oxford during the past twelve months in the way of new buildings and the restoration of old ones is given by the local *Journal*. The only works of importance in the University are the restoration of the Cathedral and All Souls' Chapel. An important work has nearly been accomplished in the western part of the city in the erection of a church in the populous district of Osney. The only other public buildings that have been erected during the past year are schools in the parishes of Cowley Saint John, Trinity, and Saint Ebbe's. Houses of various sizes still continue to be built, and villas on the Norham Manor estate.

Christ Church.—The work of restoring the Cathedral is still going on. Some portions which were first undertaken have been completed, and others are in rapid progress. The interior stonework has been cleaned and made good. The east-end wall has been rebuilt, and two Norman windows, similar to the old ones, have been placed in, with a large rose window and arcade above. A three-light memorial window has been erected in the Dean's Chapel by Messrs. Morrison & Co., of London. The floors of the nave, chancel, and south aisle have been lowered to their original levels, and the two former have been laid with marble. The south transept has been restored to its original form. The mutilated windows in the aisles, chapels, and transepts have been restored, and the monuments which disfigured the pillars have been removed to other and better situations. The tower is also undergoing a thorough renovation. The architect is Mr. Gilbert Scott, and the builder Mr. Symm.

All Souls' College.—The chapel and ante-chapel of this college are undergoing a restoration. The decayed stonework in the exterior of the walls has been replaced with new Bath stone, and new jambs, mullions, and tracery-work of the Gothic windows have also been renewed. The buttresses have been taken down and rebuilt also in Bath stone, and the whole of the pinnacles, parapets, and copings are rebuilt in Ketton stone. The windows will be filled in with the old glass. In repairing the walls in the lower portion of the chapel on the south side, the original entrance to the crypt was discovered. It was built up with ashlar stonework, and no trace of it could be seen from the outside. The work of restoration is being carried out by Mr. Kimberley, builder, Banbury. The architect is Mr. Clutton, of London.

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The house next door has undergone a transformation. The builder was Mr. G. Jones.

The old police-station at Carfax has been converted into a shop.

Some houses have been erected in St. Aldate's on the site of those which were destroyed by fire about a year and a half since.

One or two more villas have been added to those in South Parks-road, the end one having been erected by Messrs. Castle & Co.

A number of detached and semi-detached villas have been built on the Norham Manor estate. Several shops and private residences have been built in Hythe Bridge-street; and a number of houses have been erected in Cowley St. John district, Walton-street, and Kingston-street.

New school-rooms for boys and girls have recently been erected at South Hinksey: they will accommodate about 180 children.

We understand that an arrangement is in progress for providing a new boys' school for the district of St. Barnabas. It is estimated that about 1,000*l.* may be required for this purpose.

THE TRADES MOVEMENT.

Newcastle-upon-Tyne. — There were twelve engineering firms in Newcastle and Gateshead, whose men left their works upwards of twenty weeks ago, and nine of these firms made such arrangements on Thursday in last week, as would enable their old hands to recommence work either immediately or within a few days. Sir William Armstrong & Co., Messrs. Abbott & Co., and Messrs. Clark, Watson, & Gurney had not yet arrived at an understanding with the men that were out as to the time for recommencing work. The only hindrance to the men getting into full employment was, that a number of castings which had been in stock when the strike commenced had been worked up, and before the firms could give employment to all their former hands it was necessary that some of the earlier stages of their work should be somewhat advanced. It was unreasonable to expect that 2,000 men at an hour's notice could all resume their old places in factories at which operations had been more or less suspended for five months. Most of the employers, according to the reports of the delegates, behaved very considerately to their old men. Messrs. G. R. Stephenson & Co. have granted the nine-hour day's work, from 1st November, to their men, none of whom turned out with the strike. This announcement in the factory caused great rejoicings among the men, who went out in procession with their band, and at the base of George Stephenson's monument a resolution of thanks to Mr. George Robert Stephenson was carried with great cheering.

Messrs. Palmerston & Co. (limited), at Jarrow, have conceded the nine hours to the men in their extensive engine works, which arrangement, it is stated, will come into action immediately.

The central committee of Amalgamated Trades of London have addressed their fellow workmen as to the Newcastle struggle. They say,—

"An impression is abroad that all is over. We desire to state such is not the case. Unfortunately employment cannot be found for the old hands for a few weeks, until the firms have got their arrangements complete again after the long cessation caused by the struggle; therefore we hope that after sacrificing so much on their part, you will not let these good men want that support which you have so nobly acceded to them during their protracted struggle. We have to state, there are 800 men and their families to provide for; and also 1,500 foreign workmen left in Newcastle. Great numbers of these men are desirous to go to their homes. We consider it to be our duty to assist in clearing our country of them, and prevent them remaining any longer than can be avoided."

Seventy-five foreigners left Elswick Works in one morning last week, and at the other works great numbers have left. Others are preparing to leave, so that it appears likely that very few will be in the factories this week.

Leeds. — A deputation of the master and operative plumbers of Leeds have met to discuss the claims for an advance of wages and shortening of hours, put forth by the workmen, when the following resolution was unanimously agreed to:—"That for the future fifty hours shall constitute one week's work, and the rate of wages for efficient workmen shall be 6½d. per hour, and that work be commenced at half-past seven in the morning, with no stoppage for breakfast."——To the surprise and pleasure of their 3,000 work-people, Messrs. Greenwood & Batley, machine-makers, of Leeds, issued a notice, announcing that on Monday they would adopt the nine-hours system, without any reduction of wages. This concession has been made without any movement on the part of their hands.——Messrs. Fairbairn, Kennedy, & Naylor have issued notices that the working hours at Wellington Foundry are reduced to fifty-four per week, without a reduction of wages.

Hartlepool. — The nine-hours principle has been conceded to the workmen in the Middleton Ironworks at Hartlepool. A reduction of the hours of labour has also taken place in the locomotive carriage works of the Great Western Railway.

Middlesbrough.—Mr. Thomas Hughes, M.P., the arbitrator appointed by the North of England Board of Arbitration and Conciliation for the Iron Trade, has met the Board. In July last he awarded the iron workers an advance of 5 per cent. Mr. Hughes was, however, requested to reconsider his decision, on the plea that the trade returns upon which it was based were incorrect. These returns having been verified by Mr. Waterhouse, accountant, Mr. Hughes confirmed his award of July, and explained his reasons at some length. Several representatives of the men and the employers took part in the discussion, and it was finally suggested that in future the wages should be regulated by the market prices. The question was deferred for settlement.

THE FIRE AT CHICAGO.

Wonder has been felt and expressed at the frightful spread of the fire at Chicago. The existence of raised footpaths of wood has been pointed to in explanation. Mr. J. O. Heyworth, of Pewtree, West Derby, gives a more probable cause. That gentleman writes,—"We naturally exclaim, could a fire, in this age of large stone churches, walls, and brick houses, &c., sweep all before it? Surely it must have been diverted here and there in its terrible path of destruction by stone and mortar? Such would happen in any English town, but the secret of Chicago's disaster, actually within her own established free limits, where wooden houses are prohibited being built by law, lay in the almost universal absence of slate roofs. Owing to the great expense of slates, caused by tariffs in favour of some miserable specimens of slate quarries in the State of Pennsylvania, we are, in fact, compelled to roof our houses either with wooden shingles or with tar felt paper, swabbed over with melted pitch, and then strewn over with small gravel.

The heat of the sun causes the gravel in many places to sink into this pitch and expose it, as also where the paper is turned up against the interior of the outside walls, which always exceed the height of such a kind of nearly level roof as used to be the case with the roofs of old Jerusalem, which were more safely paved with stone slabs in those ancient days of careful building and small progress. In Chicago, therefore, how hopeless when once a fire had got beyond the immediate control of the fire department to expect that a stone or brick building would stop or divert the raging flames, while their almost flat roofs of wood and pitch were ready to catch the falling embers, carried along and fanned into flames by a fierce and unrelenting gale."

THE DISSOLUTION OF A BOARD OF GUARDIANS.

A sealed order was received last week at Mill-street Union, Cork, from the Poor Law Commissioners, intimating that the Commissioners would forthwith proceed to appoint paid guardians, the elected guardians having failed to discharge their duties. The great irregularity of the meetings of the guardians, who never attended in sufficient numbers, and who continued deaf to all remonstrances on the part of the Commissioners, has led to these steps being taken. The interests of the poor suffered heretofore, and the rate-payers will henceforth feel the screw, in not only being obliged to contribute to the support of the poor, but to the necessary means for the payment of the new guardians. It is some years since this extreme course has had to be adopted in the sister kingdom before; though there are occasions, even in the metropolis, where it might be resorted to with effect. Boards of guardians ought to be warned in time of the latent powers that may be employed to relieve them from the duties they so negligently discharge, and rate-payers should also be careful that their representatives are not drifting, in many districts, into a course of action, or rather inaction, that will render it necessary for the Local Government Board to send their ukase forth.

ENLARGEMENT AND EXTENSION OF THE BOROUGH-ROAD SCHOOLS, LONDON.

The training-school or college for students in the Borough-road, in connexion with the British and Foreign School Society, has just undergone a considerable enlargement in order to provide accommodation for an increased number of students. The height of the building, which is 170 ft. long, has been increased to its entire length by an additional elevation of 18 ft. Red brick, with yellow brick facings, have been used in the construction of the enlarged building, rendering the new portion uniform with the rest of the structure. The windows are circular-headed, with a pediment-headed window in the main centre, and at the extremity of the west wing a square tower has been carried up from the first floor to a height of nearly 20 ft. above the main body of the building. The interior of the additional story is intended to be set apart exclusively for dormitories, of which there will be thirty in number, for the increased students about to enter the establishment. Simultaneously with the increased elevation of the building a considerable portion of the interior has also been re-arranged.

The architects for the new works are Messrs. Beck & Lee, of Finsbury-circus; Messrs. Brown & Robinson, of Finsbury, being the contractors.

CONDITION OF LEICESTER.

PHOSPHATE SEWAGE PROCESS.

Sir,—I am desirous of confirming the very practical remark with which you conclude your description of this process at Leicester in your number of the 7th inst. You observe that "as this highly-organic precipitate is allowed to accumulate at the base of the tanks for weeks and months, secondary decomposition sets in. The generating gases rising to the surface counteract the good effects of the superior gravity of the precipitant," and "the supernatent water becomes charged with foul matter that passes off with the effluent water contaminating it with anterior sewage."

I have for the last four years been advocating,—as you may know, having given place to some of my remarks on the subject,—the separation of the solid parts of sewage from the fluid before they were decomposed and disintegrated; perfectly convinced that no effluent water could be brought to a sufficient degree of purity after they had been allowed to dissolve and decompose in it.

The Improvement Commissioners of Surbiton, in Surrey, have allowed me to experiment on a sewer in that town, and selected one under a

street, the gradient of which was so steep that there could exist no doubt in their minds that the whole contents of the sewers would pass fresh into the portable strainer which I should place in the drain to intercept it.

On analysing the sewage I became convinced that such was not the case, and after a long search I discovered a very large permanent deposit in an injudicious bend of the sewer.

By an alteration I got rid of this deposit, and I now find that whereas the sewage before the alteration contained 290 millionths of free ammonia and 130 millionths of organic nitrogen, so soon as the change in its form was effected, the sewage only contained 29 millionths of free ammonia and 2·79 millionths (say 3 millionths) of organic nitrogen.

Now, my apparatus reduced the 130 millionths to 30 millionths, but that is not sufficient; the fresh sewage does not contain nearly as much.

I reduce the 3 millionths to 2 millionths, and the effluent water is then in that respect much superior to the standard fixed by the conservators of the Thames.

It is proved to be quite practical, and it would be a great economy to the sewage companies to extract the solids fresh from the sewers. They will then find they have sufficient space for, and little trouble in, treating the effluent water.

Charles E. Austin.

"SELLING OFF THE ARCHIVES."

Sir,—As you have especially called on me to explain what passed in the late Synod of the Diocese of Ossory, relative to the library left to the clergy of that diocese by two of its prelates (Otway and Morris), I beg leave in the first place to remonstrate against the use of the word "archives." An uninformed reader, and most of your readers can have no information as to the special facts of this case, would at once conclude that Mr. Staples proposed selling the *archives of the See*. So far from this being the case, the report of the proceedings from which you took Mr. Staples's observations, shows that a salaried registrar was appointed by the Synod to take charge of the *archives of Ossory*. The library in question consists entirely of *printed books*, and it has been my anxious wish, since the time I entered this diocese, now thirty years ago, that these precious deposits should be carefully preserved, and made available; and I have taken part in more than one effort, having this object in view. All these efforts have unfortunately been abortive. From the want of a sufficient endowment, and, I am constrained to add, the lukewarmness and apathy of those whom the law gave authority in the matter, things have gone from bad to worse. The deficient arrangement which existed amongst the books, when first I knew the library, has ceased to exist, and the collection (about 6,000 volumes), is now in total confusion, and the work of damp and neglect fast progressing, to end, at no distant date, in certain reduction to pulp of the greater part of the works comprised in the collection.

The disestablishment of the Irish Church, supervening on this state of things, has made the case still more desperate for the unfortunate library of St. Canice. When the diocese has to strain every nerve to supply its spiritual wants, it is not to be supposed that money can be spared to bind, arrange, and care for a collection, which, however valuable as books of reference, yet are not an actual necessity for the work of the church amongst us. And Mr. Staples, who is a representative of Bishop Morris, one of the donors, was only doing his duty when he called attention to the disgraceful present state of the library. I, for one, cannot blame him for suggesting that they should be sold, in preference to allowing them to perish from neglect. Nor can his proposal be wondered at when in London itself no voice was raised to stay the dispersion of Archbishop Tenison's library,—a far more valuable public trust.

Allow me also to remark that you have omitted to state that the Synod did not adopt Mr. Staples's suggestion, but appointed a committee, whose duty it is, in conjunction with the bishop of the diocese, to consider the whole question, and, if possible, save the library from destruction, and make it available for the clergy of the diocese for the future. To do this funds are absolutely needed,—in fact, with adequate means, their work would be easy; and, as one of the committee, I beg to say that any help afforded by the still endowed churchmen of England will be thankfully received by your obedient servant,

James Graves,

Treasurer of the Cathedral of St. Canice.

P.S.—As the library of St. Canice is a religious institution, the Royal Historical and Archæological Association of Ireland is precluded by its rules from interfering in the matter at all.

PREMATURE OCCUPATION OF NEW HOUSES.

Sir,—A paragraph from the *Builder* has appeared in the newspapers deprecating the haste with which newly-built houses are inhabited, and alluding to the injury to health resulting from this practice. Your readers may be interested in knowing that at Milan a law exists, which enacts, that no house built of new materials shall be inhabited until a full year after its complete construction; and when old materials, arising from the demolition of other houses, have been used in building, a year and a half must elapse before the new buildings are inhabited. See "*Regolamento relativo all' uso delle case di nuova costruzione, ec.*, 1 *Marzo*, 1837," quoted in "Milano e il suo Territorio," vol. i. p. 249. Milano. 1844. It would be well if a similar law were in force in this country.

Mary P. Merrifield.

MORRELL'S DRY-ASH CLOSET SYSTEM.

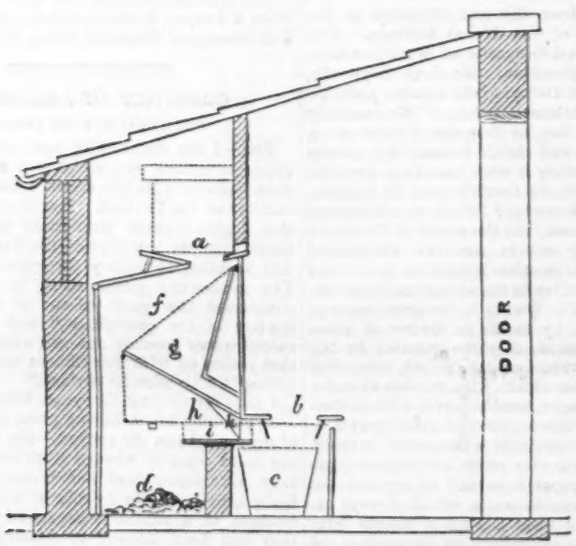
The treatment and disposal of towns' refuse is a question of such importance that we willingly place before our readers any plan which promises to aid, even in part, in the settlement of the problem: hence we give illustrations of a self-acting ash-screening closet, invented by Mr. Conyers Morrell, of Ducie-buildings, Manchester, and exhibited by him at the exhibition of Sanitary Appliances, in connexion with the Social Science Congress recently held in Leeds. The inventor claims for his invention its adaptability for general use in large towns.

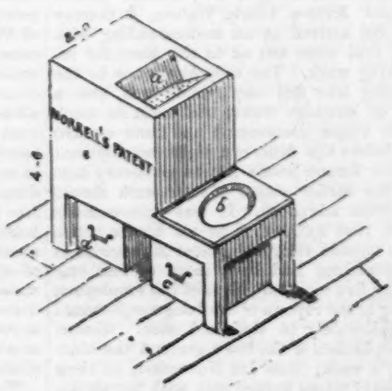
It certainly does appear to possess an advantage over the dry-earth or any other dry system yet presented to our notice, inasmuch as it makes use in a practical way of the material which is already on the premises to render inoffensive the excrementitious refuse of the dwelling. In lieu of the old ash-midden, the closet has at its rear an inclining screener, upon which the fire-refuse falls when thrown through a hole in the wall. On use of the closet the seat, by depressing, communicates a motion to this screener, which separates the *ash-dust* from the cinders, places the ash-dust in a measurer, and, in rising, from the seat, scatters the same over the soil, simultaneously throwing the cinders into a box or on to the floor, ready for collecting for re-use as fuel. The mixture of the excrement and ash-dust forms an excellent manure, which is proposed to be systematically collected and stored in its crude yet inoffensive state at suitable points in the various outlets of the town, for sale to the farmer, as he returns from market.

That in a sanitary point of view the ash-screening closet will form an excellent substitute for the old ash-midden or cesspool, there can be no doubt. Whether it would meet all requirements for the satisfactory disposal of domestic refuse on a large scale is another matter. We learn that it has already given great satisfaction where in use, and that it is about being applied on a large scale. The inventor claims, that besides procuring a valuable manure for the soil, a saving of fuel to the occupant of the house is effected, and to the town a large reduction in the cost of removing the refuse.

Mr. Morrell also exhibited a sample of the ash-manure, the actual product of the closet; plans of labourers' dwellings; and a sketch showing the process by which he proposes to cleanse the liquid refuse of the dwelling before it leaves the premises.

Dry-Ash Closet System.





a. Opening to receive unscreened ashes thrown through a hole in the wall, either at the side, front, or back.
f. Sieve, and g, hopper, both agitated by the action of seat, b.
h. Lever used to raise the hopper by depression of seat.
l. Ash-dust measurer.
k. Ash-dust distributor.
c. Deodorised excrement pan, removable at either side or front.
d. Cinders, removable from either side or back.

RELIEF FOR LONDON.

Sir,—To redeem from the hands of callous, careless, grinding, unscrupulous landlords or agents as many as possible of the worst slums of London, in the shape of close, dark, damp, dilapidated tenements, which go to make up many of the courts and squares in its crowded parts, and to reconstruct them in such a way as to secure the decency, health, and comfort of the tenants, at the lowest reasonable rental, would probably effect the greatest possible sanitary and social benefit among the poor population that could be devised. It would also be attended with this great advantage, viz., that though involving an immediate large outlay, a return would, nevertheless, arise therefrom, which, as in the case of Mr. Peabody's scheme, would fructify for further benefit.

I think Lord Shaftesbury did, on the part of some lady, employ a sum of money in this way, for a single court, with wonderful success; and he, and many besides, have most emphatically declared that the condition in which the lower class of poor are, of necessity, found as to lodging and living, is the crying evil of this great city, and lies at the root of much or most of the vice and misery that prevail; so that it is impossible to remedy them while this evil is neglected.

No doubt Mr. Peabody's gift has effected great things; but the remark is made on every hand that it does not go low enough, or clear away the existing abominations that are a plague as well as a disgrace to our civilisation, and especially leave a lasting stain and reproach upon our splendid metropolitan improvements.

One such spot as I have referred to, reclaimed and regenerated, sanitarily and socially, creates a healthier feeling around, and often compels improvements, on the score of self-interest, even from owners of property adjacent. In illustration of this, in a small way, I send herewith a report of a little effort made in the Borough in the way of remodelling a large (and formerly most wretched) lodging-house. The motto there was to help the poor to help themselves, and the benefit is very great. Jas. Lance.

SPECULATIVE BUILDERS: UPPER NORWOOD.

Sir,—In reference to an article which appeared in the *Builder* last week, may I state a case in illustration? It is, unhappily, my own.

Three months ago, I took, on lease, a house at Upper Norwood: tempted by its nearness to the Crystal Palace, the pure air, the comfort of the high-level railway, and other advantages. But, unfortunately, my landlord is "a speculative builder" (an order of which until lately I knew nothing). Before I entered on possession, he undertook to make certain improvements and additions to the house (in consideration of which I of my own accord arranged to pay him a larger rent than he asked), and to guarantee that all should be as perfect as he could make it,—more especially as to water, gas, and drainage.

He gave these engagements, not only by "word of mouth," but in writing; and his written agreement I hold.

But, inasmuch as he has mortgaged the house up to its full value (according to his statement to me), what legal remedy I have I shall in due course learn.

When I had taken possession and removed my furniture; waited patiently for my landlord to keep his word; and at length called on him to do so;—well, I will not ask you to print the opinion I was compelled to hold. Suffice it, that none of the things he agreed to do have been done,—that is to say, done by him.

I make no note of imperfect bell-hanging, shrinking windows and doors, gates without stoppers, fireplaces open behind (out of sight), and a dozen like miseries: these are incidents for which I might have been prepared, and on such common ground I expect none of your sympathy.

When the water was to be laid on, the cisterns leaked; *that* the superintendent of the water company made right—*per force*. When the gas was laid on, a respectable fitter (employed by me) discovered no fewer than eleven escapes under the floors or in the walls, any one of which, if undetected, might have set the house on fire. The gas-pipes were "bits" of several sizes, put together "anyhow." Worst of all, the defective drainage soon became apparent: the drain-pipes, which conducted to the main sewer, were covered over with earth,—such, that is to say, as were not out of sight under the basement floors. Some of these pipes were broken, others were "clapped in" (one into another), without joining of any kind: the natural consequence was that under the floors a mass of filth had accumulated, the danger from which may be readily imagined. Of course I have, at considerable cost, made *that* "all right." I was lucky in making the discovery within a month of my occupation: but my next-door neighbour (whose house is the work of the same speculative builder) was not so fortunate. She had been its inhabitant about a year; in that case mud and filth, a foot deep, had to be removed. The workmen are now finishing a work that must be very costly to the lady, who had bought the house, and has no remedy.

Now, sir, it would be idle to convey my grievances to you if you could do nothing; but you can do much, not only by impressing the warning of the old couplet:—

> "Learn to be wise by others' harm,
> And you shall do full well;"

but by telling me, and many others who are circumstanced as I am, if there be no responsibility on the part of any public officer. First, is the Board of Health powerless? Next, is the district surveyor able to do nothing? And next, is the wealthy body, the trustees of the Dulwich College (the ground landlords), without any voice in a matter in which that charity is so nearly concerned? And have they no surveyors able and willing to see that wrong is made right, as the guardians of a very large property, let, or to be let, on building leases, in this convenient and very valuable locality?

It is very likely that the cholera will pay us a visit. It may be assured of a rich harvest, and a sure halting-place at Upper Norwood, if matters remain as they are; at least there exists a strong and general belief in this neighbourhood, that the sewerage, in so far as houses are concerned, is execrable; not only calculated but certain to foster and propagate disease.

If there be no one responsible, no one with the power, no one with the will, to arrest this public nuisance and peril, it is high time that the Legislature interfere to furnish a remedy.

A Victim.

"INVITATION TO TENDER."

Sir,—If "A very Old Subscriber" will refer to the *Builder* of the 27th of May, 1865, he will see a case tried at the "Shoreditch County Court" similar to his. H. P.

DRAWINGS AND THE POST-OFFICE.

Sir,—The important alteration in the postal regulation that parcels may not exceed 18 in. in length, will, I am sure, be much annoyance to us architects, for example. A roll of drawings, under 2 ft. long, sent by me on the 6th ult. into the country by train, over 100 miles from London, took just one week on the road, besides involving correspondence and inquiry as to the cause of delay. The carriage paid was 9d., and 2d. booking; total, 11d.: whereas, if sent by the late postal regulations, the expense would have been but 4d., and the delivery of them almost certain the following morning. T. E. W.

A TWELVE HOURS MOVEMENT.

Sir,—There is a class of men I think ought to be considered before any other class, as far as regards time. I speak of the men employed in retail timber yards; they are, with few exceptions, employed from six o'clock in the morning till half-past seven or eight at night, and, I believe, you will not find in London a class of men that work harder than they do, and in the winter time they have to be out in all weathers. I think if they would all petition their employers for a reduction in the hours, and make it a general time from six o'clock in the morning till six o'clock in the evening, that they would grant their request.

Fair Play.

THE DRY ROT.

Sir,—Having been a reader of the *Builder* almost ever since its issue, it may not be unbecoming of me to ask what is the best remedy to cure the dry-rot in wood (and if any). I have often read in your valuable work, of different processes, of which I have tried two or three, but without avail. The building to which I shall refer is a good house, on the estates of the Earl of Carlisle (or trustees), near to Castle Howard. It having been built about twenty years only, last autumn it was found to be so bad that it was necessary to take out the floors over the cellars, the joists being oak, and these being as bad as it was possible to be. In substituting new joists, we took great care in selecting the best Baltic timber, also washing it and the walls well with a strong solution of sulphate of copper, of which I found note in the *Builder* of August 5th, 1843 (Margary's patent), and now, to our great surprise, we find the fungi growing as strong as before. The joists are left open, not lathed and plastered, and well ventilated, the cellar-windows being opened daily. As there have been several dry-rot remedies recommended during the last twenty years in the *Builder*, may I take the liberty to ask which of them has been most efficacious? I saw the question asked in your number for September 16th, by "Churchwarden." C. W.

ELECTRIFY THE FISH.

Sir,—When fishermen have a full net, so great is the resistance of the captured fish that the meshes often break, and they escape. Anglers know how troublesome large fish are to land; they (the fish) do not spare the rod, but bolt off with it, or hook it with a joint. Swimmers tell us it is easy to raise a half-drowned man to the surface: I have seen a man bring up a large lump of rock to near the surface to show it, then let it sink again. What I am driving at is this,—an electric battery on board fishing-ships, a copper wire to extend to the net, to give the *quietus* to the finnies. Flat fish are torpid dormants: they will school on the bottom. To wake them up I would trail the electric chain across their backs; the underliers also would receive full favours.

> "One touch of nature makes the whole world kin."
> *Shakspeare.*
>
> One touch of chain would start the flats to the swim.'
> *Myself.*

R. T.

MEN OUT OF WORK.

Sir,—I see in last week's *Builder* a statement of Mr. Potter's, that 700,000 able-bodied men are out of work. I should like to ask, where are they, and what are they? If building operatives, that class is particularly scarce in the Midland Counties; if agricultural labourers, we have also room for some. If they have daughters *fit for domestic service*, an importation is much wanted in the same district. But if these men are of the description too often to be found since the rise of trade-unions, namely, a worthless set of fellows, perfectly ignorant of the trade they profess, with no desire to learn it, we do not want them. An old Builder.

JOINTING IRON PIPES.

Sir,—About two years ago I built a conservatory for a gentleman, and the hot-water pipes were put together with iron borings, sal-ammoniac, hemp packing, and red-lead cement, and now nearly all of the joints are burst, and all of them burst during the time no fire has been kept up. Can you explain the reason? The gentleman has an idea it is the sal ammoniac that has done it; the man that put the pipes in declares it is *not*.

Would you be kind enough to give me your idea of the iron borings and sal ammoniac for such purposes. Wm. Barnard, Jun.

*** An overdose of sal ammoniac in the packing would be very likely to produce the result complained of.

THE OPENING OF DOVER COLLEGE.

The Dover College has been formally inaugurated, under the presidency of the Lord Warden of the Cinque Ports, Earl Granville, K.G. The Dover College, which has been brought into existence by the Dover Chamber of Commerce and the principal townsmen, is an institution of great importance in a town like Dover. The college is founded on the site of the ancient Priory of St. Martin, for which Dover was renowned in olden times. To the antiquary and archæologist the remains of the Priory on which the college is established have many attractions. When the question of establishing a middle-class college in Dover had been considered feasible, and when the promoters of the undertaking were looking for a desirable site for their institution, attention was called to the refectory of the ancient Priory by Mr. Parker Ayres, who assisted Dr. Plumtre in making investigations on the site. Mr. Ayres wrote a letter, in May of last year, to the secretary of the college, in which he said,—

"I think no better site could possibly be had than that portion of the Priory house and buildings now occupied by Mr. Chignell. It is a fine open space, having a frontage on the east side, abutting on Effingham-street, of 340 ft., and on the main road to Folkestone of 106 ft. There are open roads of 40 ft. wide, both on the east and south sides of the property. On the north side stands the building known as the 'Refectory,' which is generally considered one of the best of its kind in England, and dates from A.D. 1135. It is 107 ft. long and 34 ft. wide.

(It might easily be converted into separate schools at a small outlay.) And when restored, would afford a great local attraction. On the west side stands the old entrance-gate. This building might likewise be restored, and made a comfortable residence. There is a substantial and well-arranged residence for a head-master, with accommodation for over 30 boarders. The whole of the grounds, which contain an area of about 1¼ acre, are laid out with great taste, and contain some fine trees, and might altogether be made one of the prettiest spots in the vicinity. Seeing the great importance of at once establishing this school in our town, and the many and great advantages this site offers, I would suggest a deputation wait on Mr. Chignell, and ascertain if he would dispose of his interest in the property, and upon what terms."

This suggestion was ultimately adopted, and the refectory has been restored by Mr. Perry, the architect, who has taken pains to effect the restoration without impairing the Norman style of the venerable buildings.

Miscellanea.

Condition of Leicester.—The *Leicester Journal* says,—"The high death-rate of Leicester has been the subject of alarm and observation for weeks past. Several causes for this increase of mortality have been mentioned, one being the defective system by which Leicester is drained. At the last meeting of the Local Board of Health the town was assured by authority that the sewage was quite equal to the demands upon it, except in occasional instances, when flushing of the drains was promptly applied. But we now have it on the authority of the *Builder*, in an article on the condition of Leicester, that 'completely choked sewers may be counted by the dozen.' The article generally, which we publish elsewhere, draws such a picture of our unsavoury condition as a town as to heighten the alarm which was not unreasonably felt at the unenviable position the town had attained in the Registrar-General's returns. We have always urged the necessity of dealing in a comprehensive way with our system of sewerage, and have felt that the time must rapidly come when the local Board of Health could no longer decline to deal with it. For this reason we have also urged economy in matters that in themselves did not press for settlement, and were not important as not affecting the highest interest of all, the public health. The question has now been raised, and must be practically dealt with. If Local Boards, through ignorance, local jealousies, political party prejudices, or any other cause, do not or will not take the matter resolutely in hand, we trust the Government will at once deal with it as an imperial question. The evil has grown to such a magnitude that it cannot longer be tampered with,—it must be met, and if possible eradicated."

Cemetery Consecration in Yorkshire.—The Archbishop of York has consecrated the new cemetery for St. John's Parish, Masbro'. The new cemetery is situated near the village of Kimberworth. The ground is inclosed by a stone wall, and the buildings were designed by Mr. Blackmore, of Rotherham, architect. There are two chapels, one for the members of the Church of England and one for the Dissenters, each of stone, in the Early English style. Messrs. Bacon & Rawson, of Rotherham, had the supervision of the work. A house for the sexton has been erected near the entrance-gates, and a broad carriage-drive runs the whole length of the cemetery. The total area of the ground is 19,370 square yards, of which 8,800 yards have been consecrated for the use of members of the Established Church, 5,500 yards are appropriated to the use of dissenters, 3,000 yards to Roman Catholics, and 2,070 yards are unappropriated. It has been estimated that the consecrated portion of the ground will contain 1,652 graves; the Dissenters' portion, 1,063; the Roman Catholics', 583; and the unappropriated, 404. The total cost of the cemetery has been about 1,800*l*. After the consecration the archbishop proceeded to Kimberworth parish church, where he consecrated about 1 acre of ground which has been added to the burial-ground of the church. At the Rotherham Cemetery, 2a. 2r. 34p. of ground, lately added to the cemetery, were also consecrated.

Discovery of Minerals in Jersey.—The researches that have been going on here for the past few weeks tend to confirm the belief that a rich vein of lead ore had been struck. Some copper ore has been found in the parish of St. Clement, and the belief is gaining ground that the island is rich in mineral ores, that only require capital and skill in order to ensure their being brought to light.

A Clock Tower for Gatehouse. — The new clock tower, which has been in course of erection for some time back at Gatehouse-of-Fleet, in the south of Scotland, has been inaugurated with an appropriate demonstration. The site is the space immediately in front of the Murray Arms Hotel, where a view of the clock is obtained from all directions. The tower is 9 ft. square, and rises to a height of 53 ft. from the ground. The design and plans were furnished by Mr. Pilkington, of Edinburgh; the contractor for the work was the late Mr. Cairns, builder, Gatehouse; and the cost of the erection was 267*l*. The architect had to confine his plans to the amount of money raised, and a plain edifice has been erected. The tower is square in form, and is divided into three stages,—the lower portion being battered to the height of 17 ft., the middle story pierced on four sides with long, narrow, round-headed windows, and the masonry of both is of whinstone with granite facings. The upper story is built entirely of Craignair granite, and on each face of it are arched recesses for the reception of the clock. Above the clock is the belfry, which is open. The structure is surmounted by a corbelled parapet, built of granite. The manufacturers of the clock are Messrs. Gillett & Bland, of Croydon, Surrey. Several modern improvements are introduced into the mechanism.

"The General Asphalte Company."—The General Asphalte Company is announced, with a capital of 60,000*l*., in 12,000 shares of 5*l*., of which 8,800 are offered to the public, the balance of 3,200 being allotted to the vendors, fully paid up, in payment of purchase-money. The company is established to take over and extend the well-known business of Messrs. Armani & Stodart, of 35, Poultry, and Millwall, including a contract entered into with the former gentleman for the exclusive supply to him for thirty years, from 1st July last, for the United Kingdom and British colonies, of any quantity of asphalte, whether rock, powder, or prepared mastic, with a minimun of 600 tons from the mineral rock asphalte quarries at Garde Bois and Lovagny, forming part of the asphaltic basin of Seyssel, Upper Savoy. The firm has been established for twenty-three years, and has executed various works, including the road and paths at Osborne, at Tattersall's, Aldershott Camp, the arsenal and barracks at Woolwich, the barracks at Chatham, Colney hatch Lunatic Asylum, Pentonville, Chatham, and Broadmoor prisons, &c.; and as the company take over the business, with the staff, plant, and everything complete, they have the opportunity of at once rendering the capital productive.

Monthly Report on the Health of St. Marylebone.—The report for August and September, 1871, by Dr. Whitmore, medical officer of health for the parish, has been printed by order of the Vestry. The annual death-rate for the period was 22·33 per 1,000 of the population of the parish, being nearly the same as at the corresponding period of last year. Complaints having been made of the defective state of the drains at the London Crystal Palace, in Oxford-street, they were carefully inspected by Mr. Windle, who discovered no less than thirteen cesspools, some of them 4 ft. square and several feet deep, and nearly all of them containing large quantities of night-soil; the small drain-pipes, which were 4 in. in diameter, were choked up, and the soil leaking through their joints had accumulated in large masses beneath the flooring. The proper sanitary condition of the building has since then been provided for by the abolition of the cesspools and the removal of the old pipes, and by laying down upwards of 400 ft. of 6-inch and 9-inch pipes properly trapped, which carry all the drainage of the building into the sewer in Great Portland-street.

Asphalte Roadways.—The City Commissioners of Sewers have withdrawn from the Streets Committee the power they had hitherto exercised of determining the kind of asphalte which should be laid down in the streets. At the instance of Mr. Cotton, the Court resolved to exercise this power themselves. The Holborn Board of Works having complained of the dirty, slippery, and neglected state of the asphalte pavement in High Holborn, the Val de Travers Company have, through their agent, promised to see that it is properly cleansed in future. The smallness of the asphalted part of the roadway was alleged as reason for its uncleanliness, dirt being, it was said, carried on to it from the granite paving which it adjoins.

Lodgings in Mint-street, Borough.—The first annual Report of the "Farm House" Improved Lodgings, Mint-street, Borough, year ending June 25th, 1870, has been issued in a printed form. The Report bears the motto, "The best way of aiding the poor is to help them to help themselves." The objects are to establish a model house or lodgings for the residence of the *known deserving* poor, at a charge for rent not exceeding the scale of the common lodging-houses, which shall be *self-supporting*, and free from anything like the appearance of so-called "charity." The committee say, 'A happy success is attending our efforts. . . . The improved lodgings have gained a surprising influence in the district. No sooner had we commenced in earnest to make the place attractive, than many of the other lodging-house keepers determined they would not be left behind; and there has never been known such repairing and cleansing in the Mint district as during the past twelve months. . . . Whilst the building account has cost us 835*l*., we have received only 628*l*. towards this sum, leaving 207*l*. still to be cleared off."

College Improvements at Cambridge.—Extensive alterations and improvements have been made in the colleges of Cambridge during the past few years, and still the movement does not appear to flag. The building of a new master's lodge and block of students' rooms at Pembroke College is rapidly progressing. The contract, which is being executed by Mr. Horsman, Wolverhampton, is stated to be over 25,000*l*. Both buildings are of the Tudor style of architecture. The new building in Trumpington-street will provide seventeen additional sets of students' rooms, besides lecture-rooms and fellows' apartments. The building is fireproof, and is from designs by Mr. Waterhouse. At King's College operations have been commenced for erecting twelve additional sets of rooms next Trumpington-street. This contract will exceed 7,000*l*. Other alterations are contemplated at Trinity Hall and Christ's College. At the Fitzwilliam Museum, the workmen of Messrs. Cubitt & Co. are busily engaged in completing the entrance-hall according to the main features of Mr. Bassevi's original design, which Mr. Barry, architect, estimates will cost 2,000*l*.

Waterworks, Berwick.—The works for an additional supply of water to the inhabitants of Berwick-upon-Tweed have been opened. The works are at the Tower Foundry, Tweedmouth, where the water springs from the rock on the site of an old quarry at the rate of 200,000,000 gallons per day, and is stored in a tank, which has been constructed, 80 ft. long by 50 ft. wide, and 8 ft. deep. Thence the water is pumped by steam power across the Tweed to the high-service reservoir outside the town, whence it flows through the pipes for the use of the inhabitants. The lift from the engine-house to the high-service reservoir is 185 ft., giving a pressure on the lowest points of the rising main of over 80 lb. on the square inch. The cost of the new works has been computed at 7,500*l*. This sum has to be added to what had previously been expended (8,200*l*) for waterworks done in 1854, and 1,000*l*., the sum which has been deducted from time to time from the ordinary district rate to pay engineers.

Opening of Free Public Library, Derby. The Free Public Library at Derby has been formally opened by the mayor and corporation. The premises are those formerly known as the Old Town and County Library and Museum, and are situated in the centre of the Wardwick. The number of books in the lending-library alone exceeds 8,000 volumes. The total number of volumes (including the reference library) is over 13,000. Mr. Bass, M.P., gave books amounting in money value to about 400*l*.; Mr. Alderman Barber gave 50*l*. towards the purchase of books; and the Mayor of Derby, 20*l*. Mr. T. W. Evans has also given 500*l*. towards a building fund.

Acquirement of Land for Street Improvements in Liverpool.—Mr. J. J. Aston, Q.C., and a special jury have determined the compensation to be paid by the corporation for property extending from Davies-street to Cumberland-street, off Dale-street, the site of which is required for improvement purposes, under the Liverpool Improvement Act of 1867. The ground required was 72¼ square yards, and included the sites of the Commercial Hotel, Tiger Inn, and a druggist's shop. The jury awarded the claimant compensation to the amount of 1,515*l*. 5*s*., being at the rate of 19*l*. per yard.

The Newcastle College of Physical Science.—The first lecture in connexion with this College was given in the lecture-room of the Literary and Philosophical Society, Westgate-street, by Professor A. S. Herschel, B.A., F.R.A.S., the head of the department of Physics in the new institution. There was a crowded audience on the occasion, the lecture being open to the general public. Next night, Professor W. Steadman Aldis, M.A., who has been appointed to the chair of Mathematics, delivered his inaugural address in the theatre of the Literary and Philosophical Society in the presence of a large and appreciative audience. On the following evening, Professor David Page, LL.D., one of the four professors recently appointed to the College, delivered an inaugural address on "Geology" to a large and appreciative audience. Professor Marecco on the following evening delivered his address, and was also honoured with a large audience and much applause.

The Oxyhydric Light.—The officials of the Crystal Palace Company, according to the *Mechanic's Magazine*, "have laid pipes, placed gasometers in position, and will illuminate their crystal fountains and rare works of art with the Oxyhydric light; and in order that the public may have ocular demonstration of its vast superiority over gas, the lights will alternate, and then the dull yellow haze of the flickering gas-lamp will become doubly so in the steady bright light emanating from the other, which is so intense that it causes the flame of gas to cast a shadow itself on the wall, it is intended to illuminate. This new light can be obtained at a much lower rate than gas; and it is not only brilliant and clear, but healthy." Gas nowadays is a very inferior article to what it once was, and anything will be acceptable as a substitute that is only equal to what gas *can* be, much less so promising a substitute as this is said to be.

Exhibition of Water-Colour Drawings.—To aid the National Hospital for Consumption at Ventnor, a number of collectors have lent water-colour drawings, which are now open as an Exhibition at the Institute of Painters in Water-Colours, Pall-mall. It is a remarkably fine collection, 240 in number, and includes excellent works by G. Bach, Barrett, Bennett, Rosa Bonheur, Burton, Callow, G. Cattermole, D. Cox, D. Cox, jun., Davidson, De Wint, Duncan, J. Fahey, Copley Fielding, Birket Foster, A. Fripp, G. Fripp, J. Gilbert, Goodall, Carl Haag, Hine, Holland, W. Hunt, Jackson, Sir Edwin Landseer, R.A., J. F. Lewis, R.A., W. Mulready, R.A., Palmer, Prout, David Roberts, Rosetti, Collingwood, Smith, F. Tayler, F. W. Topham, J. M. W. Turner, R.A., J. Varley, J. D. Watson, and others. We cordially recommend a visit.

Constant Water-Supply.—The directors of the East London Waterworks Company have given notice that it is their desire, and so far as in them lies their intention, to substitute, service by service, for the company's present intermittent supply, the system of constant supply in all houses supplied by the company, and they say that if after this notice constant supply be not, service by service, introduced into the houses of all the water consumers, the failure will lie at their door, and will be because the water-fittings, which it is the duty of the consumers to provide in their houses, are not in proper condition to receive such supply. Let the consumers look to it.

Employment.—Under this title a report of the Sub-Committee of the Council of the Charity Organisation Society, Buckingham-street, Adelphi, has been printed and issued. This is the society to which Mr. Hollond, who recently arranged for the transference of labour from London to Lancashire, belongs. The tractate treats of "the conditions under which the society can co-operate with the guardians of the poor, in effectually utilising the labour of able-bodied destitute persons." It also contains remarks by Dr. Hawksley, the chairman of the sub-committee, who signs the report.

Substitute for White Lead.—The mineral compounds proposed by Mr. S. J. Hennis, of Liverpool, to be used as a paint and for other purposes, are manufactured from finely disintegrated native silicate of alumina (which forms an excellent substitute for white lead) as a base, together with vegetable and other stainers, mixed with dryers and raw linseed oil. When used as a cement, to be applied to damp walls and other purposes, a mixture of the native silicate of alumina is compounded with glue, barytes, and resin, or boiled oil.

Holbeck Church Bells.—The new peal of eight bells, presented to this church by Mr. J. E. Woodhouse and his wife has been inaugurated. The Leeds parish church ringers rang a plain course, and then a peal of Kent Treble Bob Major, consisting of 5,120 changes, brought round in three hours and sixteen minutes. There was no serious hitch of any kind. During the day the bells were also rung by sets of ringers from Otley, Dewsbury, Birstal, Hunslet, and Burley, who treated the listeners to various touches of Bob Major and Kent Treble Bob. The practical men present agreed in saying that the Messrs. Warner, of London, the founders, have supplied to this church one of the best peals of eight bells in the north of England.

The Utilisation of Sewage.—The Portsmouth Local Board have resolved to utilise their sewage; and an offer by Messrs. Russ & Minns, of London, has virtually been accepted. The following are the principal terms:—A lease of twenty-five years, the rent to commence on the 29th of September next. For the first five years the lessees are to pay 500*l.* per annum; second five, 600*l.*; third five, 700*l.*; fourth five, 800*l.*; and the remaining period, 1,000*l.* The system thus proposed to be adopted is for irrigation, and large tracts of land a few miles from Portsmouth will be put under the system. It is also said that many thousands of acres will be now reclaimed from the sea.

The Durham and Northumberland Architectural Society.—The members of the Durham and Northumberland Architectural and Archæological Society held their last meeting of the season at Alnwick, last week. By permission from the Duke of Northumberland, the members visited Alnwick and Hulne Abbeys. Returning to the town, the members repaired to St. Michael's Vicarage, when the Rev. H. B. Trotter exhibited a collection of rubbings of monumental brasses. The old parish church of St. Mary and St. Michael, close by the vicarage, was next visited. At the invitation of the society, Mr. F. R. Wilson acted as guide throughout the day.

Belgravia and South Kensington Newroad.—The *Post* wisely puts in a plea for this undertaking. It understands that the promoters of the long-desired improvement purpose making a last effort to carry it into effect. The powers of the company for the acquisition of the necessary land expire shortly; but it is stated that another (the fourth) Act of Parliament will be applied for in the coming session, if the Metropolitan Board of Works determine upon aiding the undertaking. There is an absolute necessity for a through communication between Belgravia and the important new neighbourhood of South Kensington.

The Sewage of Salford. — It has been unanimously resolved in the Town Council of Salford "to construct, by contract or otherwise, an intercepting sewer for the Salford district, to carry off the sewage and ordinary rainfall from the whole of the district, with provision for discharging the storm water by means of existing or other outlet sewers, according to the plans or specifications of Scheme No. 1, prepared by the Salford district surveyor; the estimate of the cost of the works, including the cost of reconstructing subsidiary sewers, amounting to 15,220*l.*" The cost of the scheme No. 2 would be 27,000*l.*, and of scheme No. 3, 26,000*l.*

Sculpture: All Saints' New Church, Cheltenham.—Four more statues of Apostles have been placed in the niches of the nave; carvings to the north door are now also completed, being special gifts by members of the congregation. Mr. R. L. Boulton, of Cheltenham, is the sculptor. The same sculptor executed the stone and wood carvings on the pulpit, font, and church at Duffryn, mentioned in our last number.

Columbia Fish Market.—There have been great quantities of herrings, plaice, and the cheaper kinds of fish in this market throughout the past week. The blocks of "model dwellings" (by the Industrial Dwellings Company), adjoining the market, are being roofed in, and one-half of them will be fit for occupation by Christmas. They will accommodate several hundred persons.

Windsor Castle.—Mr. G. G. Scott's works in the Horse-Shoe Cloisters, Windsor Castle, are now complete. A new library is to be erected on the site of the old one, with a turret—the whole in brick.

Avebury Temple.—It is stated that the owner of this remarkable monument, Mr. Edwards, of Pewsey, has consented to set aside arrangements which had been made for erecting several buildings on the site, and is willing, on public grounds, to sell it on reasonable terms, so that it may be secured from future risk. We are glad to hear that a movement has been commenced to promote this purchase.

Elvaston Castle.—This building has been lighted with gas. The fittings for the hall have been supplied by Messrs. J. Defries & Sons, Houndsditch, and the work has been done under the superintendence of Mr. Harvey, engineer. Provision is also made for the ventilation of every room. There is a ten-light chandelier in the hall, and three figures in armour supporting the upright portion.

The late Dean Alford.—On Monday afternoon a statue of the late Dr. Alford, Dean of Canterbury, was publicly unveiled by the cathedral architect, Mr. Harry G. Austen, in the niche of the west front of the cathedral at Canterbury. It has been subscribed for and erected by the Canterbury Harmonic Union, of which the late dean was both founder and president. The memorial of the late dean is placed next to the statue of Erasmus.

TENDERS

For town-hall and free library buildings, Bilston. Mr. G. Bidlake, architect:—

Sansom	£5,602 0 0
Chapelle	5,525 0 0
Garlick	5,484 0 0
Corbet	5,464 0 0
Trow	5,407 0 0
Moore	5,292 0 0
Lovatt	5,207 0 0
Barkitt	5,183 0 0
Nelson	4,979 0 0

For office and warehouse to sugar refinery, Love-lane, Liverpool, for Messrs. Henry Tate & Sons. Mr. W. J. Mason, architect. Quantities supplied by Mr. G. Northcroft, Liverpool:—

Nicholson & Ayre	£4,559 0 0
Haigh	4,317 0 0
Wells	4,260 0 0
Urmson	4,146 0 0
Rome	4,140 0 0
Tomkinson (accepted)	4,127 0 0

For the insertion of shop-front, and sundry additions and repairs, to No. 8, Glebe-street, Stoke-on-Trent, for Mr. W. Moody. Mr. Edwin Penn, architect:—

Mifflin & Davis	£155 0 0
Ogden	180 0 0
Bradbury	173 11 6
Pope	135 0 0
Barlow (accepted)	134 0 0

For Holy Trinity Church, Penge. Messrs. Newman & Billing, architects. Quantities by Mr. W. F. Meakin:—

Downs	£8,360 0 0
Brass	8,334 0 0
Manley & Rogers	8,137 0 0
Carruthers	7,439 0 0
Browne & Robinson	7,235 0 0
Patrick & Sons	7,195 0 0
Wood	7,194 0 0
Colsman	7,180 0 0
Turner & Son	7,135 0 0
Dove, Bros.	6,875 0 0
Patman & Fotheringham	6,856 0 0
Colls & Son	6,770 0 0

For the erection of dwelling-houses, shops, stabling, &c., Whitecross-street, St. Luke's. Mr. W. Seekham Witherington, architect:—

Cross & Holmes	£2,170 0 0
Elkington (accepted)	2,127 0 0

For Belchamp Walter National Schools, Essex:—

Mason & Son	£597 17 0
Grimwood & Son	593 0 0
Theobald (accepted)	550 0 0

For new offices at Sandy, for Mr. E. T. L. Smith. Mr. John Usher, architect:—

Field	£279 0 0
Corby	274 0 0
Haynes (accepted)	247 0 0

For new shop and premises, 57, High-street, Bedford, for Mr. H. A. Smith. Mr. John Usher, architect:—

Carter	£1,114 0 0
Corby	1,091 0 0
Howe (too late)	1,070 0 0
Hull (accepted)	1,040 0 0

For new printing works, for Messrs. Hill, High-street, Bedford. Mr. F. T. Mercer, architect. Quantities supplied:—

Harvey	£546 0 0
Day	473 4 0
Moore	465 0 0
Cunvin	461 0 0
Corby	445 0 0
Haynes	440 0 0
Richards	385 9 6
Carter	377 15 0

For works at Outwood, in Surrey, for Admiral Giffard. Mr. F. J. Dibble, architect:—

	House.	Coach-house, Stable, &c.
Putney	£2,207 10 0	£321 10 0
Russell	2,200 0 0	670 0 0
Barnes	2,100 0 0	630 0 0
Hamblin (accepted)	2,024 0 0	578 0 0

For the erection of new training college, Battersea, for the Wesleyan Educational Committee, Westminster. Messrs. Pocock, Corfe, & Parker, architects. Quantities supplied by Messrs. Northcroft & Co.:—

Cullum	£4,995 0 0
Hobson	4,978 0 0
Myers & Sons	4,969 0 0
Parsons	4,950 0 0
Hill, Keddell, & Waldram	4,875 0 0
Carter & Son	4,797 0 0
Mill & Co.	4,699 0 0
Sheppard	4,680 0 0
Thompson	4,560 0 0
Niblett & Son (accepted)	4,300 0 0

For infants' school and sundry alterations and additions to St. Paul's Schools, Dorking. Mr. F. J. Dibble, architect:—

Hamblin (accepted)	£552 0 0

For alterations, &c., No. 35, Walbrook, for Mr. Teker. Mr. Wimble, architect:—

		Fittings.
Ramsay	£527 0 0	...
Staines & Son	477 0 0	£52 15 0
Newman & Mann	476 0 0	—
Falkner	425 0 0	64 0 0

For new corn-exchange and offices, Bedford. Messrs. Ladds & Powell, architects. Quantities supplied by Mr. Thos. Ladds:—

		Extra for wainscot.	Allowance for old materials.
Brass	£8,850	£450	£190
Harrison & Son	8,250	320	250
Carter	7,930	470	200
Twelvetrees	7,821	277	164
Staines & Son	7,680	380	250
Pattinson Brothers	7,518	340	216
Howe	7,495	300	175
Jackson & Shaw	7,420	430	40
Dover, Dowel, & Co.	7,400	364	250
Young	7,388	400	110
Lacey	7,245	330	250
Moore	6,955	400	124
Vickers	6,780	270	250

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We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

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